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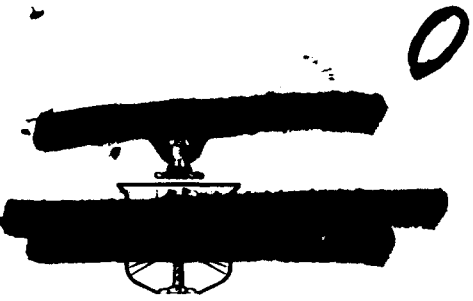

UNITED STATES DEPARTMENT OF COMMERCE
Luther H. Hodges, Secretary

OFFICE OF TECHNICAL SERVICES
John C. Green, Director

SB-452

HIGH TEMPERATURE METALLURGY AND HEAT RESISTANT ALLOYS

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HEAT RESISTANT ALLOYS

Tour, & Co., Inc., New York, N.Y.
HOT TURNING OF SELECTED STEELS AND HIGH TEMPERATURE ALLOYS (cobalt alloys). Summary-Final rept. 1950. 84p.
Order from LC mi$3.75 ph$11.25 PB 100208

U.S. Lewis Flight Propulsion Lab., Cleveland, O.
RESISTANCE OF SIX CAST HIGH-TEMPERATURE ALLOYS TO CRACKING CAUSED BY THERMAL SHOCK, by Whitman, Hall and others. (includes vitallium - thermal properties) 1950. 26p.
Order from LC mi$2.00 ph$3.75 PB 100297

EFFECTS OF AN AGING TREATMENT ON LIFE OF SMALL CAST VITALLIUM GAS-TURBINE BLADES, by Hoffman and Yaker. 1950. 25p.
Order from LC mi$2.00 ph$3.75 PB 100494

National Defense Research Committee.
ADVISORY REPORT ON INDEXING OF DIVISION 18 NDRC REPORTS: Reports on Heat Resistant Alloys, by Forsyth. (includes alloys, high temperature - bibliography) 1946. 38p.
Order from LC mi$2.25 ph$5.00 PB 100301

Office of Naval Research
WELDABILITY OF ALLOYS FOR HIGH-TEMPERATURE SERVICE, by Linnert. 1947. 81p.
Order from LC mi$3.75 ph$11.25 PB 100305

National Adv. Committee for Aeronautics (NASA)
SOME PROPERTIES OF HIGH-PURITY SINTERED WROUGHT MOLYBDENUM METAL AT TEMPERATURES UP TO 2400°F, by Long, Dike and others. 1951. 57p.
Order from LC mi$2.75 ph$7.50 PB 103357

DIFFUSION OF CHROMIUM IN α COBALT-CHROMIUM SOLID SOLUTIONS, by Weeton. 1950. 38p.
Order from LC mi$2.25 ph$5.00 PB 102279

DEVELOPMENT OF MAGNESIUM-CERIUM FORGED ALLOYS FOR ELEVATED-TEMPERATURE SERVICE, by Grube, Kaiser and others. 1951. 80p.
Order from LC mi$3.50 ph$10.00 PB 103358

FUNDAMENTAL AGING EFFECTS IN INFLUENCING HIGH-TEMPERATURE PROPERTIES OF SOLUTION-TREATED INCONEL X, by Frey, Freeman and others. 1951. 56p.
Order from LC mi$2.75 ph$7.50 PB 104109

EFFECTIVENESS OF CERAMIC COATINGS IN REDUCING CORROSION OF FIVE HEAT-RESISTANT ALLOYS BY LEAD BROMIDE VAPORS, by Moore and Mason. 1951. 24p.
Order from LC mi$2.00 ph$3.75 PB 104112

CRITICAL REVIEW OF NOTCH SENSITIVITY IN STRESS-RUPTURE TESTS, by Brown and Sachs. 1951. 29p.
Order from LC mi$2.00 ph$3.75 PB 104806

U.S. Air Materiel Command. Engineering Div. Aircraft Lab., Wright Field, Dayton, O.
FIRE TESTS ON MAGNESIUM ALLOY CASTINGS, by Grimes (includes magnesium castings - high temperature properties) 1947. 9p.
Order from LC mi$1.25 ph$1.25 PB 100997

INVESTIGATION OF THE STRESS RUPTURE PROPERTIES AT 1500°F OF A NUMBER OF HIGH TEMPERATURE ALLOYS, by Fields and Rector. 1949. 28f.
Order from LC mi$2.00 enl pr$5.00 PB 103390

DEVELOPMENT OF SHEET MATERIALS FOR HIGH TEMPERATURE APPLICATIONS, by Meierdirks and Mohling. 1948. 38p.
Order from LC mi$2.25 ph$5.00 PB 107255

REFRACTORY METAL REINFORCED SUPER ALLOYS, by Krol and Goetzel, Loewy Research & Development Div. 1949. 29p.
Order from LC mi$2.00 ph$3.75 PB 107258

UTILIZATION OF LOW ALLOY MATERIALS FOR HIGH TEMPERATURE SERVICE APPLICATIONS, by Miller, Smith and others. 1949. 65p.
Order from LC mi$3.00 ph$8.75 PB 107260

V-36 ALLOY: DETERMINATION OF DESIGN DATA, by Simmons, Battelle Memorial Institute, Columbus, O. 1950. 18p.
Order from LC mi$1.75 ph$2.50 PB 107262

Office of Naval Research, London Branch.
BRANCH SYMPOSIUM ON HIGH TEMPERATURE STEELS AND ALLOYS FOR GAS TURBINES (vanadium steel), by Shaler. 1951. 32p.
Order from LC mi$2.25 ph$5.00 PB 103890

INVESTIGATION OF THE MICROCONSTITUENTS IN CHROMIUM-BASE, CHROMIUM-IRON-MOLYBDENUM ALLOYS AND THEIR BEHAVIOR WITH HEAT TREATMENT. 1949. 147f.
Order from LC mi$5.75 enl pr$20.00 PB 104478

Dow Chemical Co. Magnesium Labs., Midland, Mich.
EVALUATION OF MECHANICAL PROPERTIES AND FOUNDRY CHARACTERISTICS OF MAGNESIUM-BASE CASTING ALLOYS RECOMMENDED FOR ELEVATED TEMPERATURE APPLICATIONS:
First monthly progress rept. 1950. 9p.
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Fourth monthly progress rept. 1950. 30p.
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Final rept. 1951. 70p.
Order from LC mi$3.00 ph$8.75 PB 103793

MIT., Cambridge, Mass.
FABRICATION OF HIGH-MELTING-POINT ALLOYS BY SPRAYING AND SINTERING, by Cline, Thurston and others. 1949. 23p.
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Battelle Memorial Inst., Columbus, O.
INVESTIGATION OF THE FUNDAMENTAL FACTORS PROMOTING HIGH-TEMPERATURE STRENGTH OF ALLOYS. (includes cobalt-chromium alloys) Summary rept., by McBride, Elsea and others. 1949. 58p.
Order from LC mi$2.75 ph$7.50 PB 104552

INVESTIGATION OF THE FUNDAMENTAL FACTORS PROMOTING HIGH-TEMPERATURE STRENGTH OF ALLOYS, by McBride, Elsea and others. (includes cobalt-chromium alloys) 1949. 54p.
Order from LC mi$2.75 ph$7.50 PB 105075

ALLOYS FOR HIGH-TEMPERATURE SERVICE. Quart. prog. rept., by Cross. (includes cobalt-chromium-molybdenum alloys) 1949. 17p.
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Battelle Memorial Inst., Columbus, O.
FUNDAMENTAL INVESTIGATION OF THE CAUSES OF CRACKING IN WELDS AND ADJACENT PARENT METAL, by Williams, Voldrich and others. Summary rept. 1949. 57p.
Order from LC mi$2.75 ph$7.50 PB 105125

COMPARISON OF THE HIGH-TEMPERATURE PROPERTIES OF ML ALLOY AND 142 ALLOY AT ROOM TEMPERATURE, 400°F., and 600°F. Final rept., by Craighead, Eastwood and others. 1948. 20p.
Order from LC mi$1.75 ph$2.50 PB 107257

Ill. Univ. Dept. of Theoretical and Applied Mechanics, Urbana, Ill.
PAST WORK ON FATIGUE OF METALS IN THE HIGH TEMPERATURE FIELD, by Dolan. 1950. 47p.
Order from LC mi$2.50 ph$6.25 PB 105249

Ill. Univ. Dept. of Ceramic Engineering, Urbana
SAG RESISTANT PROPERTIES OF METALS AND ALLOYS, by Plankenhorn and Bennett. 1950. 23p.
Order from LC mi$2.00 ph$3.75 PB 107985

N.Y. State College of Ceramics, Alfred, N.Y.
SUMMARY OF PROGRESS IN THE INVESTIGATION OF PHASE RELATIONSHIPS BETWEEN METALS AND OXIDES IN AIR AT HIGH TEMPERATURES. Summary rept., by Mahon. 1949. 67p.
Order from LC mi$3.00 ph$8.75 PB 107990

National Adv. Committee for Aeronautics (NASA)
RUPTURE PROPERTIES OF LOW-CARBON N-155 TYPE ALLOYS MADE WITH A COLUMBIUM-TANTALUM FERRO-ALLOY, by White, Freeman and Reynolds. 1951. 11p.
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INVESTIGATION OF INFLUENCE OF CHEMICAL COMPOSITION ON FORGED MODIFIED LOW-CARBON N-155 ALLOYS IN SOLUTION-TREATED AND AGED CONDITION AS RELATED TO RUPTURE PROPERTIES AT 1200°F, by Reynolds, Freeman and White. 1951. 111p.
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FUNDAMENTAL EFFECTS OF COLD-WORKING ON CREEP PROPERTIES OF LOW-CARBON N-155 ALLOY, by Frey, Freeman and White. 1951. 45p.
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EFFECTS OF SOME SOLUTION TREATMENTS FOLLOWED BY AN AGING TREATMENT ON THE LIFE OF SMALL CAST GAS-TURBINE BLADES OF A COBALT-CHROMIUM-BASE ALLOY.
II. EFFECT OF SELECTED COMBINATIONS OF SOAKING TIME, TEMPERATURE, AND COOLING RATE, by Hoffman and Robards. 1951. 19p.
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CERAMIC COATINGS FOR PREVENTION OF CARBON ABSORPTION IN FOUR HEAT-RESISTANT ALLOYS, by Pitts and Moore. 1951. 14p.
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FUNDAMENTAL EFFECTS OF COLD-WORK ON SOME COBALT-CHROMIUM-NICKEL-IRON BASE CREEP-RESISTANT ALLOYS, by Frey, Freeman and White. 1952. 12p.
Order from LC mi$1.75 ph$2.50 PB 105941

SURVEY OF PORTIONS OF THE COBALT-CHROMIUM-IRON-NICKEL QUATERNARY SYSTEM, by Kamen and Beck. 1952. 62p.
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ABNORMAL GRAIN GROWTH IN S-816 ALLOY, by Rush, Freeman and White. 1952. 30p.
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INFLUENCE OF STRUCTURE ON PROPERTIES OF SINTERED CHROMIUM CARBIDE, by Hamjian and Lidman. 1952. 21p.
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FURTHER INVESTIGATION OF THE EFFECT OF SURFACE FINISH ON FATIGUE PROPERTIES AT ELEVATED TEMPERATURES, by Ferguson. 1954. 27p.
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EVALUATION OF ALLOYS FOR VACUUM BRAZING OF SINTERED WROUGHT MOLYBDENUM FOR ELEVATED-TEMPERATURE APPLICATIONS, by Dike. 1954. 13p.
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HIGH-RESOLUTION AUTORADIOGRAPHY, by Towe, Gomberg and Freeman. (includes nickel, copper and tungsten - autoradiography) 1954. 140p.
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TENSILE AND COMPRESSIVE STRESS-STRAIN PROPERTIES OF SOME HIGH-STRENGTH SHEET ALLOYS AT ELEVATED TEMPERATURES, by Hughes, Inge and Prosser. (includes nickel alloys - tensile properties) 1954. 32p.
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Alloy Engineering & Casting Co., Champaign, Ill.

ADVANCED CASTING TECHNIQUES AND PROCESSES. Summary and final rept. of casting research and development program. 1950. 147p.
Order from LC mi$5.75 ph$18.75 PB 109239

Calif. Univ. Inst. of Engineering Research, Berkeley, Calif.

CORRELATIONS OF RUPTURE DATA FOR METALS AT ELEVATED TEMPERATURES, by Orr, Sherby and Dorn. (includes aluminum, aluminum alloys, beryllium and molybdenum-rupture) 1953. 30p.
Order from LC mi$2.25 ph$4.00 PB 111348

NOL, White Oak, Md.

THERMENOL, A NON-STRATEGIC ALUMINUM-IRON BASE ALLOY FOR HIGH TEMPERATURE SERVICE, by Nachman and Buehler. 1954. 18p.
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Minnesota. Univ., Minneapolis, Minn.

DAMPING, ELASTICITY, AND FATIGUE PROPERTIES OF UNNOTCHED AND NOTCHED N-155 AT ROOM AND ELEVATED TEMPERATURES, by Demer and Lazan. 1953. 77p.
Order from LC mi$3.75 ph$10.25 PB 111618

U.S. Arsenal, Watertown, Mass.

SURVEY AND BIBLIOGRAPHY ON THE DETERMINATION OF THERMAL CONDUCTIVITY OF METALS AT ELEVATED TEMPERATURES, by Seibel. 1954. 67p.
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National Research Corp., Cambridge, Mass.

INVESTIGATION OF NICKEL BASE PRECIPITATION HARDENING ALLOYS, by Sinizer. 1955. 45p.
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Alleghany Ludlum Steel Corp., Watervliet Research Lab.

DEVELOPMENT OF WROUGHT AND CAST ALLOYS FOR HIGH TEMPERATURE APPLICATIONS, by MacFarlane, DeFries and others. (cobalt-alloys) 1955. 93p.
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Battelle Memorial Inst., Titanium Metallurgical L Lab., Columbus, O.

SELECTION OF MATERIALS FOR HIGH-TEMPERATURE APPLICATIONS IN AIRFRAMES, by Gordon. (includes titanium alloys - thermal properties) 1955. 38p.
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Australia. Dept. of Supply. Defence Research Labs., Maribyrnong, Victoria.

HIGH-TEMPERATURE ALLOYS, a bibliography by Hood. 1953. 105p.
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Rand Corp., Santa Monica, Calif.

CALCULATIONS FOR REACTIONS OF CHROMIUM, MOLYBDENUM, TITANIUM AND TUNGSTEN WITH OXYGEN, NITROGEN, HYDROGEN, CARBON AND SULFUR, by Ward, Ray and Herres. 1948. 97p.
Order from LC mi$4.50 ph$12.75 PB 113262

National Research Council. Div. of Engineering & Industrial Research. Minerals & Metals Advisory Board.

REPORT ON THE RECOVERY OF CRITICAL AND STRATEGIC METALS FROM HIGH ALLOY SCRAP, BY PANEL ON HIGH ALLOY SCRAP UTILIZATION. 1953. 30p.
Order from LC mi$2.25 ph$4.00 PB 113480

Syracuse. Univ. Dept. of Materials Engineering, Syracuse, N.Y.

DYNAMIC CREEP AND RUPTURE PROPERTIES OF TEMPERATURE RESISTANT MATERIALS UNDER TENSILE FATIGUE STRESS, by Lazan. 1949. 42p.
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MIT., Dept. of Metallurgy, Cambridge, Mass.

PERIODIC STATUS REPORT NO. 6, by Chang. Monkman and others. (I. Deformation studies of metals at elevated temperatures. - II. Iron-chromium-nickel ternary system. - III. Effect of structure and composition on the strength properties of stainless steel.) 1954. 6p.
Order from LC mi$1.50 ph$1.50 PB 116312

Syracuse. Univ., Syracuse, N.Y.

PROPERTIES OF TEMPERATURE - RESISTANT MATERIALS UNDER TENSILE AND COMPRESSIVE FATIGUE STRESS, by Lazan and Westberg. 1952. 45p.
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DAMPING, ELASTICITY, AND FATIGUE PROPERTIES OF TEMPERATURE - RESISTANT MATERIALS, by Lazan and Demer. 1952. 42p.
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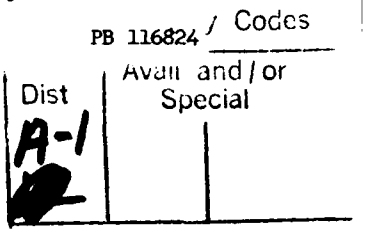

American Electro Metal Corp., Yonkers, N.Y.
INVESTIGATION AND EVALUATION OF NEW HIGH TEMPERATURE MATERIALS, by Arbeiter, Schwarzkopf and others:
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CEMENTED BORIDES (Physical properties). Summary prog. rept., by Geaser, Ford and others:
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From June 1952 to May 1953. 188f.
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INVESTIGATION OF VARIOUS PROPERTIES OF NiAl, by Wachtell and Herz:
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PERIODIC STATUS REPORT NO. 6, by Chang. Monkman and others. (I. Deformation studies of metals at elevated temperatures. - II. Iron-chromium-nickel ternary system. - III. Effect of structure and composition on the strength properties of stainless steel.) 1954. 6p.
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Australia. Dept. of Supply. Defence Research Labs., Maribyrnong, Victoria.
HIGH-TEMPERATURE ALLOYS, a bibliography by Hood. 1953. 105p.
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Mich. Univ. Engineering Research Inst., Ann Arbor
DEVELOPMENT OF PROCEDURES FOR THE IDENTIFICATION OF MINOR PHASES IN HEAT-RESISTANT ALLOYS BY ELECTRON DIFFRACTION, by Brockway and Bigelow:
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Minnesota. Univ., Minneapolis, Minn.
INVESTIGATION OF AXIAL LOADING FATIGUE PROPERTIES OF HEAT-RESISTANT ALLOY N-155, by Lazan and De Money:
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Part 2 1953. 42p.
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Calif. Univ. Inst. of Engineering Research. Minerals Research Lab., Berkeley, Calif.
SOME FUNDAMENTAL EXPERIMENTS ON HIGH TEMPERATURE CREEP, by Dorn. (includes aluminum, cadmium and indium - creep - tests) 1954. 63p.
Order from LC mi$3.25 ph$9.00 PB 116837

CORRELATIONS OF HIGH TEMPERATURE CREEP DATA, by Sherby and Dorn. (includes ceramic materials-metals creep) 1955. 37p.
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National Adv. Committee for Aeronautics (NASA)
COOPERATIVE INVESTIGATION OF RELATIONSHIP BETWEEN STATIC AND FATIGUE PROPERTIES OF WROUGHT N-155 ALLOY AT ELEVATED TEMPERATURES, by NACA Subcommittee on Heat-Resisting Materials. 1955. 92p.
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PRELIMINARY INVESTIGATION OF PROPERTIES OF HIGH-TEMPERATURE BRAZED JOINTS PROCESSED IN VACUUM OR IN MOLTEN SALT, by Gyorgak and Francisco. 1955. 29p.
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MIT., Dept. of Metallurgy, Cambridge, Mass.
I. DEFORMATION STUDIES OF METALS AT ELEVATED TEMPERATURES. II. IRON-CHROMIUM-NICKEL TERNARY SYSTEM. III. EFFECT OF STRUCTURE AND COMPOSITION ON THE STRENGTH PROPERTIES OF STAINLESS STEEL, by Grant, Chang and others. 1954. 3p.
Order from LC mi$1.50 ph$1.50 PB 117907

Franklin Inst., Labs. for Research & Development, Philadelphia, Pa.
MAGNETIC AND STRUCTURAL PROPERTIES OF PRECIPITATING FERROMAGNETIC SYSTEMS. Quart. rept. Sept - Nov 1954, by Berkowitz. (includes gold-nickel, alloys, copper-nickel - high temperature - structure - magnetic properties) 1954. 33p.
Order from LC mi$3.00 ph$6.30 PB 118559

Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
DEVELOPMENT OF FORGING AND CASTING ALLOYS FOR TURBINE BUCKETS, by De Vries and Mohling. (includes cobalt-tungsten-columbium alloys) 1951. 59p.
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Adv. Group for Aeronautical Research & Development
PAPERS PRESENTED DURING THE TRAVELING SEMINAR, Palais de Chaillot, Paris. 1954. 81p.
Order from NASA PB 119095

Wall Colmonoy Corp. Research Lab., Detroit, Mich.
DEVELOPMENT OF BRAZING ALLOYS FOR JOINING HEAT RESISTANT ALLOYS, by Miller, Gonser and Peaslee. 1955. 73p.
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Mich. Univ. Engineering Research Inst., Ann Arbor
INVESTIGATION OF THE INFLUENCE OF BORON AND TITANIUM ON THE HIGH-TEMPERATURE PROPERTIES OF Cr-Ni-Mo-Fe AUSTENITIC ALLOYS, by Corey and Freeman. 1954. 72p.
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THERMAL-SHOCK INVESTIGATION, by Hunter, Thomas and Bobrowsky. 1954. 106p.
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NOTCH SENSITIVITY OF HEAT-RESISTANT ALLOYS AT ELEVATED TEMPERATURES, by Voorhees and Freeman:
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NOTCH SENSITIVITY OF AIRCRAFT STRUCTURAL AND ENGINE ALLOY. Part I: PRELIMINARY STUDIES WITH A-286 and 17-7 PH(TH 1050) ALLOYS. 1957. 43p.
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Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
DEVELOPMENT OF LEAN-ALLOY CHROMIUM-NICKEL STAINLESS STEELS FOR HIGH TEMPERATURE USE, by Salvaggi and Guarnieri. 1954. 86p.
Order from LC mi$4.80 ph$13.80 PB 121026

INVESTIGATION OF THE COMPRESSIVE, BEARING AND SHEAR CREEP-RUPTURE PROPERTIES OF AIRCRAFT STRUCTURAL METALS AND JOINTS AT ELEVATED TEMPERATURES, by Vawter, Guarnieri and others. (includes aluminum and titanium alloys - creep tests) 1956. 194p.
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INVESTIGATION OF THE COMPRESSIVE, BEARING, AND SHEER CREEP-RUPTURE PROPERTIES OF AIRCRAFT STRUCTURAL METALS AND JOINTS AT ELEVATED TEMPERATURES, by Vawter, Guarnieri and others. (includes aluminum alloys, monel metal, and steel, stainless - creep tests) 1956. 95p.
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DEVELOPMENT OF LOW ALLOY Ti-B STEELS FOR HIGH TEMPERATURE SERVICE APPLICATIONS. 1952. 77f.
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Calif. Univ., Los Angeles, Calif.
EQUIPMENT FOR TESTING THE CREEP PROPERTIES OF METALS UNDER INTERMITTENT STRESSING AND HEATING CONDITIONS, by Shepard, Wiseman and others:
Part 2: CURRENT MODIFICATIONS. 1954. 29p.
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CORROSION PROPERTIES OF VARIOUS MATERIALS IN HIGH TEMPERATURE WATERS, by Lancaster. 1953. 24p.
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FATIGUE, CREEP, AND RUPTURE PROPERTIES OF HEAT RESISTANT MATERIALS, by Vitovec and Lazan. 1956. 213p.
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DYNAMIC CREEP, STRESS-RUPTURE, AND FATIGUE PROPERTIES OF 24S-T4 ALUMINUM AT ELEVATED TEMPERATURES. Part I: UNNOTCHED SPECIMENS, by de Money and Lazan. 1954. 51p.
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Battelle Memorial Inst., Columbus, O.
DEVELOPMENT OF A FORGEABLE HIGH-STRENGTH, HIGH-TEMPERATURE, CHROMIUM-RICH, CHROMIUM-IRON ALLOY, by Moon, Blank and Hall. 1954. 24p.
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SELECTION OF MATERIALS FOR HIGH-TEMPERATURE APPLICATIONS IN AIRFRAMES. Suppl. to TML rept. 13, by Gordon and Jackson. (includes airplanes - materials - titanium) 1956. 30p.
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APPLICATION OF A NEW STRUCTURAL INDEX TO COMPARE TITANIUM ALLOYS WITH OTHER MATERIALS IN AIRFRAME STRUCTURES, by Jackson and Gordon. 1955. 33p.
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PROPERTIES OF TITANIUM ALLOYS AT ELEVATED TEMPERATURES, by Schwartzberg, Holden and others. 1957. 288p.
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COMPILATION OF ELEVATED-TEMPERATURE PROPERTY DATA FOR TITANIUM AND SOME ALTERNATIVE METALS, by Holden, Schwartzberg and others. 1958. 169p.
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SALT CORROSION OF TITANIUM ALLOYS AT ELEVATED TEMPERATURE AND STRESS. Prog. rept., by Mallory-Sharon Titanium Corp, Pratt & Whitney Aircraft, Rem-Cru Titanium, Inc., Republic Steel Corp. and Titanium Metals Corp. of America. (Appendix: Stress corrosion results for nonprotected commercial titanium alloys coated with sodium chloride) 1957. 57p.
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ALLOYS FOR HIGH-TEMPERATURE SERVICE. Final rept., by Beck, Fletcher and others. (includes cobalt-chromium-tungsten, nickel-cobalt-chromium, cobalt-chromium-molybdenum, iron-chromium-cobalt and chromium-cobalt-nitrogen alloys) 1952. 26p.
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TECHNICAL MANUAL ON THE MACHINING OF THERMENOL. (includes aluminum-iron-molybdenum alloys - machinability) 1956. 22p.
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TEMPER BRITTLENESS OF BORON-TREATED STEEL, by Rosenberg. (includes steel, titanium and zirconium-boron - brittleness) 1956. 66p.
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DEVELOPMENT OF CAST IRON-BASE ALLOYS OF AUSTENITIC TYPE FOR HIGH HEAT-RESISTANCE AND SCALE-RESISTANCE, by Eberle, Hoke and Leyda. 1957. 99p.
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U.S. Naval Engineering Experiment Station, Annapolis, Md.
ELEVATED TEMPERATURE PROPERTIES OF HASTELLOY X, by Williams. 1953. 10p.
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Crucible Steel Co. of America. Crescent Lab., New York, N.Y.
RESEARCH ON HIGH TEMPERATURE SHEET MATERIALS, by Murphy and Ferrall. 1948. 26p.
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Franklin Inst. Labs. for Research and Development, Philadelphia, Pa.
MAGNETIC AND STRUCTURAL PROPERTIES OF PRECIPITATING FERROMAGNETIC SYSTEMS. (includes crystals, gold-nickel - preparation) Annual summary rept., by Berkowitz. 1955. 8p.
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NRL
LOW EXPANSION ALLOYS FOR MAIN STEAM LINES, by Kramer. 1940. 61p.
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INFLUENCE OF HOT-WORKING CONDITIONS ON HIGH-TEMPERATURE PROPERTIES OF A HEAT-RESISTANT ALLOY, by Ewing and Freeman. 1956. 135p.
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DROP TEST FOR THE EVALUATION OF THE IMPACT STRENGTH OF CERMETS, by Pinkel, Deutsch and Katz. 1955. 8p.
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TENSILE PROPERTIES OF HK31XA-H24 MAGNESIUM--ALLOY SHEET UNDER RAPID-HEATING CONDITIONS AND CONSTANT ELEVATED TEMPERATURES, by Gibbs. 1956. 20p.
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TENSILE PROPERTIES OF INCONEL AND RS-120 TITANIUM-ALLOY SHEET UNDER RAPID-HEATING AND CONSTANT-TEMPERATURE CONDITIONS, by Heimerl, Kurg and Inge. 1956. 29p.
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INVESTIGATION OF THE NiAl PHASE OF NICKEL-ALUMINUM ALLOYS, by Grala. 1957. 33p.
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STUDY OF THE "TOSS FACTOR" IN THE IMPACT TESTING OF CERMETS BY THE IZOD PENDULUM TEST, by Probst and McHenry. 1957. 13p.
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STUDY OF THE IMPACT BEHAVIOR OF HIGH-TEMPERATURE MATERIALS, by Probst and McHenry. (includes cermets, titanium carbide - impact tests) 1957. 23p.
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RUPTURE STRENGTH OF SEVERAL NICKEL-BASE ALLOYS IN SHEET FORM, by Dance and Claus. 1957. 24p.
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HOMOGENEOUS ALLOY INGOTS PRODUCED BY CONSUMABLE-ELECTRODE ARC MELTING, by Beall, Capute and Hayes. (includes zirconium alloys - production) 1956. 14p.
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X-RAY STUDIES OF ORDER-DISORDER IN ALLOYS, by Warren. (includes alloys, binary - equilibrium diagrams and goldcopper alloys - crystal structure) 1955. 18p.
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I. DEFORMATION STUDIES OF METALS AT ELEVATED TEMPERATURES. II. IRON-CHROMIUM-NICKEL TERNARY SYSTEM. III. EFFECT OF STRUCTURE AND COMPOSITION OF THE STRENGTH PROPERTIES OF STAINLESS STEEL. IV. EFFECT OF COLD WORK ON THE STRENGTH PROPERTIES OF STAINLESS STEELS. Periodic status rept. 12, by Grant, Price and others. 1955. 7p.
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I. DEFORMATION STUDIES OF METALS AT ELEVATED TEMPERATURES. II. IRON-CHROMIUM-NICKEL TERNARY SYSTEM. III. SUB-STRUCTURE STUDIES. Periodic status rept. 14, by Cuff, Pride and others. 1956. 6p.
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Armour Research Foundation, Chicago, Ill.
TITANIUM ALLOYS FOR ELEVATED TEMPERATURE APPLICATION by Carew, Crossley and others. 1953. 134p.
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U.S. Air Material Command. Wright-Patterson AFB., Dayton, O.
STRESS CORROSION OF HEAT RESISTANT ALLOYS AT ELEVATED TEMPERATURES, by Perlmutter. 1947. 24p.
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Schwarzkopf Dev. Corp., Yonkers, N.Y.
CEMENTED BORIDES. Summary progress report, by Binder. 1956. 38p.
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Mich. Univ. Engineering Research Inst., Ann Arbor
INVESTIGATION OF THE MINOR PHASES OF HEAT RESISTANT ALLOYS BY ELECTRON DIFFRACTION AND ELECTRON MICROSCOPY, by Brockway and Bigelow. 1955. 79p.
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Minn. Univ. Dept. of Mechanics and Materials, Minneapolis, Minn.
DAMPING, ELASTICITY AND FATIGUE PROPERTIES OF TITANIUM ALLOYS, HIGH TEMPERATURE ALLOYS, STAINLESS STEELS, AND GLASSLAMINATE AT ROOM AND ELEVATED TEMPERATURES, by Podnieks and Lazan. 1956. 93p.
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Tenn. Univ. Metallurgy Div. Dept. of Chemical Engineering, Knoxville, Tenn.
ACCELERATED OXIDATION OF HIGH TEMPERATURE ALLOYS AS INFLUENCED BY CONTAMINATION WITH SODIUM COMPOUNDS AND CERTAIN FUEL OIL ASH COMPONENTS, by Cunningham and Brasunas. (includes corrosion - measuring equipment; sodium sulfate-vanadium pentoxide - anticorrosive effects) Final and summary rept. 1955. 82p.
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SHORT-TIME HIGH-TEMPERATURE TENSILE PROPERTIES OF SIX SHEET ALLOYS, by Miller and Guarnieri. 1948. 20p.
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RESEARCH ON HEAT RESISTANT ALLOYS STRENGTHENED AT ELEVATED TEMPERATURES BY INCORPORATION OF FINE PARTICULATE SUBSTANCES (includes nichrome -Nickel alloy)-testing equipment and titanium carbides - thermal properties). Interim rept. no. 1, by Epner and Goetzel. 1956. 12p.
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HIGH-TEMPERATURE PROPERTIES OF TITANIUM-BORON STEELS, by Niederberger. 1956. 17p.
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BIMONTHLY PROGRESS REPORT ON DEVELOPMENT OF SUBSTITUTE ALLOYS FOR HIGH TEMPERATURE USE, by Salvaggi and Guarnieri. 1954. 15p. Report no. I
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RESEARCH AND DEVELOPMENT OF WROUGHT AND CAST HIGH TEMPERATURE ALLOYS, by MacFarlane, DeFries and others. 1954. 98p.
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EFFECT OF OVER HEATING ON CREEP-RUPTURE PROPERTIES OF S-816 ALLOY AT 1500°, by Rowe and Freeman. 1957. 75p.
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ABNORMAL GRAIN GROWTH IN M-252 AND S-816 ALLOYS, by Decker and Rush. 1957. 61p.
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THE USEFUL HEAT CAPACITY OF SEVERAL MATERIALS FOR BALLISTIC NOSE-CONE CONSTRUCTION, by Stalder. 1957. 19p.
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Martin Co., Baltimore, Md.
DEVELOPMENT OF BRAZED SANDWICH CONSTRUCTION MATERIAL FOR HIGH-TEMPERATURE APPLICATION (procedures were developed for brazing honeycomb cores to stainless steel skins to form sandwich material suitable for elevated temperature applications), by Maxwell, Siltanen and Mueller. 1956. 78p.
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Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
DEVELOPMENT OF SUBSTITUTE ALLOYS FOR HIGH TEMPERATURE USE (steel, stainless - creep tests). Bimonthly progress report. 1954. 10p.
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AGING IN COMPLEX COMMERCIAL NICKEL-CHROMIUM ALLOYS HARDENED WITH TITANIUM AND ALUMINUM, by Wilde and Grant. 1956. 31p.
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Clevite Research Corp. Clevite Research Center, Cleveland, O.
DEVELOPMENT OF TITANIUM ALLOYS FOR ELEVATED TEMPERATURE SERVICE BY POWDER METALLURGICAL TECHNIQUES (includes titanium alloys - mechanical properties - effect of temperature), by Jech and Weber. 1957. 84p.
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CREEP PROPERTIES OF METALS UNDER INTERMITTENT STRESSING AND HEATING CONDITIONS. Part 2. INTERMITTENT HEATING (includes aluminum alloys - creep tests), by Shepard, Starr and others. 1954. 38p.
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LIMITING HIGH TEMPERATURE CREEP AND RUPTURE STRESSES OF SHEET ALLOYS FOR JET APPLICATIONS, by Guarnieri and Salvaggi. 1951. 51p.
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CYCLIC LOADING EFFECTS ON THE CREEP PROPERTIES OF SHEET MATERIALS, by Gillig and Guarnieri. 1951. 35p.
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RECORD OF CONFERENCE ON FATIGUE OF METALS AT HIGH TEMPERATURES, by Porter and Yearian. 1950. 177p.
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SHORT TIME HIGH TEMPERATURE BENDING FATIGUE PROPERTIES OF SHEET MATERIALS, by Gillig. 1949. 32p.
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Southern Research Inst., Birmingham, Ala.
DETERMINATION OF TENSILE, COMPRESSIVE, BEARING AND SHEAR PROPERTIES OF FERROUS AND NON-FERROUS STRUCTURAL SHEET METALS AT ELEVATED TEMPERATURES, by Melonas and Kattus. 1957. 308p.
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CHROMIUM-NICKEL ALLOYS FOR HIGH TEMPERATURE APPLICATIONS, by Bucklin and Grant. 1955? 19p.
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MATERIALS—PROPERTY—DESIGN CRITERIA FOR METALS. Part VI: CONVENTIONAL SHORT-TIME ELEVATED-TEMPERATURE PROPERTIES OF SELECTED ALLOYS (includes magnesium alloys - thermal properties), by Favor, Achbach and Hyler. 1957. 258p.
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CRYSTALLOGRAPHIC STRUCTURE AND ORIENTATION OF THE Y' PHASE IN FOUR COMMERCIAL NICKEL-BASE ALLOYS, by Amy and Bigelow. 1957. 18p.
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STUDY OF THE METALLURGICAL PROPERTIES THAT ARE NECESSARY FOR SATISFACTORY BEARING PERFORMANCE AND THE DEVELOPMENT OF IMPROVED BEARING ALLOYS FOR SERVICE UP TO 1000 F, by Bhat and Nehrenberg. 1957. 74p.
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INVESTIGATION OF THE EFFECTS OF INCONGRUOUS ELEMENTS AND THE INTERACTION EFFECTS OF THESE ELEMENTS ON HIGH TEMPERATURE STRENGTH OF Fe-Co-Ni-Cr ALLOYS, by Sye, Robertshaw and Richmond. 1957. 111p.
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THERMAL PROPERTIES OF HIGH TEMPERATURE MATERIALS, by Fieldhouse, Hedge and others. 1958. 88p.
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EFFECT OF PRIOR CREEP ON MECHANICAL PROPERTIES OF AIRCRAFT STRUCTURAL METALS (2024-T86 ALUMINUM AND 17-7 PH STAINLESS), by Gluck, Voorhees and Freeman. 1958. 116p.
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DEVELOPMENT OF OXIDATION AND LIQUID SODIUM RESISTANT BRAZING ALLOYS, by Canonico and Schwartzbart. 1958. 47p.
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Mallory, P.R. & Co., Inc. Metallurgical Research Lab., Indianapolis, Ind.
STUDY OF THE POSSIBILITY OF REINFORCING HIGH-TEMPERATURE ALLOYS BY ADDITION OF REFRACTORY POWDERS (includes chromium-nickel alloys - oxidation), by Burney. 1958. 49p.
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Westinghouse Electric Corp. Aviation Gas Turbine Div., Kansas City, Mo.
STUDIES AND COMPARISON OF THE PROPERTIES OF HIGH TEMPERATURE ALLOYS MELTED AND PRECISION CAST BOTH IN AIR AND IN VACUUM, by Stutzman. 1958. 113p.
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Sagamore Ordnance Materials Research Conference, 4th, Sagamore Conference Center, Racquette Lake,NY
HIGH TEMPERATURE MATERIALS, THEIR STRENGTH POTENTIALS AND LIMITATIONS (metals). 1957. 362p
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Sintercast Corp. of America, Yonkers, N.Y.
RESEARCH ON HEAT RESISTANT ALLOYS STRENGTHENED AT ELEVATED TEMPERATURES BY INCORPORATION OF FINE PARTICULATE SUBSTANCES (includes chromium-nickel alloys - density), by Gregory and Epner. 1956. 29p.
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INVESTIGATION OF THE COMPRESSIVE, BEARING, AND SHEAR CREEP-RUPTURE PROPERTIES OF AIRCRAFT STRUCTURAL METALS AND JOINTS AT ELEVATED TEMPERATURES (includes titanium and aluminum alloys), by Yerkovich. 1958. 124p.
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National Research Corp., Cambridge, Mass.
RESEARCH ON THE EFFECTS OF GASEOUS IMPURITIES IN METALS AND ALLOYS. Final report, by Moore and Hamilton. 1951. 136f
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Babcock & Wilcox Co., New York, N.Y.
WELDABILITY OF THE CHROMIUM, NICKEL, MOLYBDENUM STAINLESS STEELS. Final report, by Wylie and Coleman. 1956. 101f
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EFFECT OF PRIOR AIR FORCE OVERTEMPERATURE OPERATION ON LIFE OF J47 BUCKETS EVALUATED IN A SEA-LEVEL CYCLIC ENGINE TEST, by Signorelli, Johnston and Garrett. 1958. 41p.
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Brussels. Universite Libre. Laboratoire de Chimie Physique Moleculaire, Brussels, Belgium
VAPORIZATION OF COMPOUNDS AND ALLOYS AT HIGH TEMPERATURE, by Goldfinger and Drowart. 1957. 41p.
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USAF. ARDC. WADC. Materials Lab., Wright-Patterson AFB, Dayton, O.
EVALUATED-TEMPERATURE TESTING PROCEDURES. Part 1: CONTINUOUS RECORDING OF TIME DEFORMATION READINGS DURING CREEP-RUPTURE TESTING AT TEMPERATURES UP TO 1200°F, by Rector and Townsley. 1955. 12p.
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Jet Propulsion Lab. Calif. Inst. of Tech., Pasadena
STABILITY OF TITANIUM DIBORIDE AND ZIRCONIUM DIBORIDE IN AIR, OXYGEN AND NITROGEN, by Brown. 1955. 15p.
Order from LC mi$2.40 ph$3.30 PB 133895

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EFFECT OF OVERHEATING ON CREEP-RUPTURE PROPERTIES OF M-252 ALLOY, by Rowe and Freeman. 1958. 83p.
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CASTING AND FORGING TURBINE BUCKET ALLOYS, by Pitler and Dyrkacz. 1953. 70p.
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Babcock & Wilcox Co., Research Center, Alliance, O.
DEVELOPMENT OF CAST IRON-BASE ALLOYS OF AUSTENITIC TYPE FOR HIGH HEAT-RESISTANCE AND SCALE-RESISTANCE, by Eberle, Leyda and others. 1955. 73p.
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Dow Chemical Co., Midland, Mich.
CREEP BEHAVIOR OF MAGNESIUM-CERIUM ALLOYS. 1954. 41p.
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Ohio State Univ. Research Foundation, Columbus, O.
HIGH TEMPERATURE EFFECTS OF BORON IN IRON AND IRON ALLOYS, by Goldhoff, Spretnak and Speiser. 1956. 62p
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Calif. Univ. Dept. of Engineering, Los Angeles,
TEMP-TAPES: IMPROVED DESIGN, CONSTRUCTION, AND CALIBRATION (includes alloys, high temperature - melting point), by Ambrosio and Bussel. 1953. 36p.
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National Adv. Committee for Aeronautics (NASA)
TRANSGRANULAR AND INTERGRANULAR FRACTURE OF INGOT IRON DURING CREEP, by Shepard and Giedt. 1958. 26p.
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INFLUENCE OF HEAT TREATMENT ON MICROSTRUCTURE AND HIGH-TEMPERATURE PROPERTIES OF A NICKEL-BASE PRECIPITATION-HARDENING ALLOY, by Decker, Rowe and others. 1958. 53p.
Order from NASA (TN 4329) PB 134940

Mich. Univ., Ann Arbor, Mich.
HIGH-TEMPERATURE PROPERTIES OF FOUR LOW-ALLOY STEELS FOR JET-ENGINE TURBINE WHEELS (properties at 1000°, 1100°, and 1200° F are reported for jet-engine turbine wheels made from four low-alloy hardenable steels. The steels were SAE 4340, 1.25 Cr-Mo-Si-V ('17-22A'S), 3 Cr-Mo-W-V (H-40), and 12 Cr-Mo-W-V (C-422)), by Zonder, Rush and Freeman. 1953. 77p.
Order from LC mi$4.50 ph$12.30 PB 135130

Calif. Univ. Inst. of Engineering Research, Berkeley, Calif.
DESIGN AND EVALUATION DATA FOR STRUCTURAL METALS. Part I: CREEP PROPERTIES OF METALS UNDER INTERMITTENT STRESSING AND HEATING CONDITIONS (includes aluminum alloys), by Shepard, Starr and others. 1953. 113p.
Order from LC mi$6.00 ph$18.30 PB 135149

Mich. Univ. Engineering Research Inst., Ann Arbor
EXPERIMENTAL STUDY RELATING TO THE PREDICTION OF ELEVATED-TEMPERATURE STRUCTURAL BEHAVIOR FROM THE RESULTS OF TESTS AT ROOM TEMPERATURE (includes aluminum alloys), by Allen. 1956. 48p.
Order from LC mi$3.30 ph$7.80 PB 135218

Carnegie Inst. of Tech. Metals Research Lab. Pittsburgh, Pa.
PHASE TRANSFORMATIONS IN HYPOEUTECTOID TITANIUM-CHROMIUM ALLOYS, by Aaronson, Andes and others. 1956. 34p.
Order from LC mi$3.00 ph$6.30 PB 135222

Sintercast Corp. of America, Yonkers, N.Y.
RESEARCH ON HEAT RESISTANT ALLOYS STRENGTHENED AT ELEVATED TEMPERATURES BY INCORPORATION OF FINE PARTICULATE SUBSTANCES, by Gregory, Epner and Goetzel:
Interim rept. no. 3 1956. 13p.
Order from LC mi$2.40 ph$3.30 PB 135381
Interim rept. no. 5 (stress-rupture tests at 1500-1800°F of 80:20 nickel chromium alloy powders sintered with 17 1/2% by volume of alumina or titanium carbide) 1956. 21p.
Order from LC mi$2.70 ph$4.80 PB 135908

National Adv. Committee for Aeronautics (NASA)
MECHANISM OF BENEFICIAL EFFECTS OF BORON AND ZIRCONIUM IN CREEP-RUPTURE PROPERTIES OF A COMPLEX HEAT-RESISTANT ALLOY (the effects of the addition of small amounts of boron and zirconium on creep properties of an alloy containing 55 percent nickel, 20 percent chromium, and 15 percent cobalt, with molybdenum, titanium, and aluminum were studied. These additions improved the creep-rupture properties at 1,600°F because of a stabilizing effect on the grain boundaries), by Decker and Freeman. 1958. 54p.
Order from NASA (TN4286) PB 135763

Armour Research Foundation, Chicago, Ill.
PILOT PRODUCTION OF PROMISING ELEVATED TEMPERATURE TITANIUM-BASE ALLOYS (ingots weighing up to 113 lbs. and up to 6 inches in diameter were cast in titanium-base alloys: (1) 6% aluminum, (2) 6% aluminum - 4% vanadium, (3) 6% aluminum-0.5% silicon, and (4) 7% aluminum-3% molybdenum), by McPherson. 1956. 76p.
Order from LC mi$4.50 ph$12.30 PB 136558

Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
COMPRESSIVE-CREEP PROPERTIES OF HIGH-TEMPERATURE MATERIALS (the high-temperature alloy and metal-ceramic materials in creep when subjected to static compression stresses in the temperature range of 1350 to 1800°F), by Yerkovich and Guarnieri. 1954. 53p.
Order from LC mi$3.60 ph$9.30 PB 137396

Mich. Univ. Research Inst., Ann Arbor
DEVELOPMENT OF APPARATUS AND METHODS FOR MEASUREMENT OF CREEP AT TEMPERATURES TO 3500°F (the Geiger temperature indicating and recording unit (GETIR) has been successfully coupled to a motor-generator set to control the temperature of an induction-heated furnace. Life tests on a graphite induction furnace with no protection for the graphite show a life of approximately sixty hours at a temperature of 3300°F), by Sinnott. Prog. rept. no. 14 1949. 10p
Order from LC mi$1.80 ph$1.80 PB 137450

Allegheny Ludlum Steel Corp., Watervliet, N.Y.
INVESTIGATION OF HIGH TEMPERATURE PROPERTIES OF 13 CR - 15 NI AUSTENITIC STEEL CONTAINING MO, W, TI AND B (a steel containing 12.5 CR - 15 Ni - 2 Mo - .4 W - .5 Ti - .10 B - .06 C was found to have outstanding stress-rupture properties in the range 1200° to 1500°F), by MacFarlane, Reynolds and Dyrkacz. Final rept. on item 1 1953. 30p.
Order from LC mi$2.70 ph$4.80 PB 138451

Mich. Univ., Research Inst., Ann Arbor
DEVELOPMENT OF APPARATUS AND METHODS FOR MEASUREMENT OF CREEP AT TEMPERATURES TO 3500°F, by Sinnott:
Prog. rept. no. 3 1948. 8p.
Order from LC mi$1.80 ph$1.80 PB 138457
Prog. rept. no. 4 (includes metals - testing equipment) 1948. 8p.
Order from LC mi$1.80 ph$1.80 PB 138947
Prog. rept. no. 5 (Three of the four types of furnaces that were proposed for this project have been constructed and tested for various time periods and at various temperature levels. Work on the Geiger counter method of temperature measurement shows that this device is probably more accurate than the usual optical pyrometer with the sensitivity actually improving as the temperature is raised. An improved extensometer system has been evolved which practically eliminates creep in the specimen threads and has a sensitivity on the order of two-millionths of an inch per inch and should be applicable to 1800°C or 3250°F) 1948. 13p.
Order from LC mi$2.40 ph$3.30 PB 138460
Prog. rept. no. 6 (The creep testing machine and extensometer system reported in the fifth progress report have been built and tested at room temperature. Work on the Geiger tube temperature measuring instrument has been proceeding satisfactorily. A simple molybdenum wound furnace has been developed and given service for over 150 hours at a temperature of 2700°F) 1949. 10p.
Order from LC mi$1.80 ph$1.80 PB 138461

Springfield Armory, Mass.
HOT-HARDNESS INVESTIGATIONS OF COLUMBIUM AND SOME COLUMBIUM ALLOYS (hardness investigations were conducted at temperatures up to 1500°F on commercially pure columbium columbium - 40 percent tantalum alloy, and columbium - 8 per cent zirconium alloy. For comparison purposes, additional hot-hardness data were obtained on commercially pure tantalum, tungsten, molybdenum, molybdenum - 0.15 per cent cobalt alloy, Stellite 21, and a 4150 modified steel) 1958. 18p.
Order from LC mi$2.40 ph$3.30 PB 139574

NRL, Washington, D.C.
EFFECT OF PRIOR COLD WORK ON THE HIGH-TEMPERATURE PROPERTIES OF A CHROMIUM-MOLYBDENUM STEEL (the effect of cold work on the high-temperature properties of a quenched and tempered chromium-molybdenum steel was investigated by means of stress-rupture and relaxation tests. The material with several levels of cold reduction (0, 8, 15, and 39% of cross-sectional area) was tested in stress-rupture at 700°, 800°, 900°, and 1000°F (370°, 425°, 480°, and 540°C) in the stress range of 45,000 to 128,000 psi, and in relaxation at 900°F (480°C) and 80,000 psi initial stress), by Shahinian. Final rept. 1955. 21p.
Order from LC mi$2.70 ph$4.80 PB 139594

Georgia Inst. of Tech. Engineering Experiment Station, Atlanta, Ga.
INVESTIGATION OF HIGH TEMPERATURE RESISTANT MATERIALS (initial work was devoted to coating 1/16 inch molybdenum-sheet substrates with aluminum, gold, nickel, platinum, rhodium and silicon, respectively, as single films by evaporation, sputtering or electroplating), by Walton, Poulos and Mason. Summary rept. no. 1 1957. 213p.
Order from LC mi$9.60 ph$33.30 PB 139926

Metcut Research Associates, Inc., Cincinnati, O.
MACHINING CHARACTERISTICS OF HIGH STRENGTH THERMAL RESISTANT MATERIALS (a study of turning, milling, drilling, tapping and grinding has been conducted on AISI 4130, AISI 4340, 17-22 AS, Chromalloy, Vasco Jet 1000, Unimach 2, Peerless 56, Super Tricent, UHS-260, Halcomb 218, A-286, 410 Stainless, R-235, Udimet 500, Inconel 901 and Inconel 700. The data is presented to show the relationships between tool life, cutting speed, feed, tool geometry and tool materials), by Nowikowski. Interim engineering rept. no. 4 1959. 132p.
Order from LC mi$6.90 ph$21.30 PB 140083

MACHINING CHARACTERISTICS OF HIGH STRENGTH THERMAL RESISTANT MATERIALS, Phase II, by Nowikowski:
Interim rept. no. 2 1958. 54p.
Order from LC mi$3.60 ph$9.30 PB 140796
Interim rept. no. 3 1958. 100p.
Order from LC mi$5.40 ph$15.30 PB 140797
Interim rept. no. 4 1959. 52p.
Order from LC mi$3.60 ph$9.30 PB 140082
Interim rept. no. 5 1959. 157p.
Order from LC mi$7.50 ph$24.30 PB 140798
Interim rept. no. 6 (a study of the machining characteristics in turning, milling, drilling, and tapping on twenty-five high strength, thermal resistant alloys. The data is presented in graphical form to show the relationships between tool life, cutting speed, feed, tool geometry, tool material and cutting fluids) 1959. 424p.
Order from OTS at $6.00 PB 161369

Naval Engineering Experiment Station, Annapolis,
AN EVALUATION OF A THERMENOL CASTING (a commercial casting of Thermenol, a 16% aluminum - 3% molybdenum-iron base alloy, was evaluated and structurewise was found to be unsuitable for superheater tube support plate applications), by Greenert. 1955. 14p.
Order from LC mi$2.40 ph$3.30 PB 140855

Georgia Inst. of Tech. Engineering Experiment Station, Atlanta
INVESTIGATION OF HIGH TEMPERATURE RESISTANT MATERIALS (effects of particle size and substrate temperature on adherence of flame-spray coatings on mild steel using a powder containing 85 per cent zirconia and 15 per cent titania. Two materials were investigated as possible base coats for flame-sprayed alumina. Coatings produced from flame-sprayed titania showed excellent room temperature adherence), by Mason and Walton. Summary rept. no. 2 1958. 113p.
Order from LC mi$6.00 ph$18.30 PB 142326

Central Inst. for Industrial Research (Norway)
INVESTIGATION OF THE MECHANISM OF THE OXIDATION OF TITANIUM AND TITANIUM ALLOYS AT HIGH TEMPERATURES (a study was made of the reactions of O with Ti between 300° and 1000°C and with various Ti alloys between 800° and 1000°C), by Kofstad. 1957. 92p.
Order from LC mi$5.40 ph$15.30 PB 143044

Battelle Memorial Inst., Columbus, O.
THE DEVELOPMENT OF CHROMIUM-BASE HEAT-RESISTANT ALLOYS, by Blocher, Campbell and others. 1954. 170p.
Order from LC mi$7.80 ph$25.80 PB 143650

Armour Research Foundation, Chicago, Ill.
DEVELOPMENT OF COBALT-BASE ALLOYS (in an intensive study of the potentialities of all useful cobalt-base binary alloy systems, approximately 200 alloy compositions were studied), by Rausch. Summary rept. 1958. 61p.
Order from LC mi$3.90 ph$10.80 PB 144136

Battelle Memorial Inst., Columbus, O.
HIGH-TEMPERATURE-ALLOY CUTTING PROGRAM (new methods for cutting high-temperature alloys included chemical machining, chemical cutting by high-velocity jets, abrasive slurries, ultrasonics, electro-arc and electrospark machining, explosive cutting, and electrolytic machining), by Clifford, Semones and McCallum. Final engineering rept. 1959. 153p.
Order from LC mi$7.50 ph$24.30 PB 144650

RESEARCH AND DEVELOPMENT OF PROCEDURES FOR JOINING OF SIMILAR AND DISSIMILAR HEAT-RESISTING ALLOYS BY ULTRASONIC WELDING, by Weare, Antonevich and others. 1959. 83p.
Order from LC mi$4.80 ph$13.80 PB 145015

Metcut Research Associates, Inc., Cincinnati, O.
MACHINING CHARACTERISTICS OF HIGH STRENGTH THERMAL RESISTANT MATERIALS. Phase III. MACHINE TOOL REQUIREMENTS (the required range of speeds, feeds and power in turning, milling, drilling, tapping and grinding are listed in tables for each alloy group. Several recent developments in machine tools designed specifically for machining the high strength thermal resistant alloys are also described), by Nowikowski. 1959. 55p.
Order from LC mi$3.60 ph$9.30 PB 145016

Springfield Armory, Mass.
COLUMBIUM AS A HIGH TEMPERATURE STRUCTURAL MATERIAL (an investigation was made to determine the influence of oxygen in the strengthening and hardening of columbium at both elevated and room temperatures), by Abbe. 1959. 25p.
Order from LC mi$2.70 ph$4.80 PB 145530

Ohio State U. Research Foundation, Columbus, O.
THE OXIDATION CHARACTERISTICS OF COLUMBIUM ALLOYS (Cb-Zr-Ti and Cb-Zr-Cr alloys), by Gordon, Speiser and Scheuermann. 1959. 56p.
Order from LC mi$3.60 ph$9.30 PB 145625

Republic Steel Corp., Canton,O.
INVESTIGATION OF THE HIGH TEMPERATURE PROPERTIES OF HS88 AUSTENITIC STEEL MODIFIED BY ADDITIONS OF MOLYBDENUM, TUNGSTEN, TITANIUM, BORON, COBALT, ALUMINUM AND NITROGEN, by Whitmer, Poole and Griffin. 1954. 37p.
Order from LC mi$3.00 ph$6.30 PB 146285

Watertown Arsenal Labs., Mass.
THE CHROMIUM-COLUMBIUM BINARY SYSTEM (the complete binary system chromium-columbium has been developed, using metallographic, X-ray diffraction and thermal analysis techniques), by Misencik. Master's thesis. 1960. 45p.
Order from LC mi$3.30 ph$7.80 PB 147279

Crucible Steel Co. of America, Syracuse, N.Y.
DEVELOPMENT OF A DUCTILE, OXIDATION-RESISTANT AND HIGH STRENGTH SINGLE-PHASE (AUSTENITIC) ALLOY BASED ON Fe-Al-Mn-C SYSTEM (work was initiated to develop a ductile, oxidation-resistant and high strength alloy based on the Fe-Al-Mn-C system for use at intermediate temperatures (1100 to 1400 F)), by Gibson. Bimonthly prog. rept. no. 2 1960. 14p.
Order from LC mi$2.40 ph$3.30 PB 148003

Georgia Inst. of Tech. Engineering Experiment Station, Atlanta
INVESTIGATION OF HIGH TEMPERATURE RESISTANT MATERIALS (includes refractory coatings - test results and silicon dioxide - temperature factors), by Mason, Walton and others. Quart. rept. no. 14 1959. 30p.
Order from LC mi$2.70 ph$4.80 PB 148059

Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
IMPROVEMENT OF Cr-Ni-Mo IRON BASE ALLOYS BY VACUUM MELTING AND CASTING, by Gillig. Final rept. 1959. 16p.
Order from LC mi$2.40 ph$3.30 PB 148243

Georgia Inst. of Tech. Engineering Experiment Station, Atlanta
INVESTIGATION OF HIGH TEMPERATURE RESISTANT MATERIALS (zirconium-carbide- and titanium-carbide-forming thermite reactions were studies with regard to throttling materials (alumina versus kaolin, EPK), binders (core oil versus a saturated solution of aluminum hydroxide), carbon source for carbide-forming (graphite versus lampblack), and various shrouding techniques during ignition), by Walton and Mason. Quart. rept. no. 11 1958. 35p.
Order from LC mi$3.00 ph$6.30 PB 148455

Crucible Steel Co. of America, Syracuse, N.Y.
DEVELOPMENT OF A DUCTILE, OXIDATION-RESISTANT AND HIGH STRENGTH SINGLE-PHASE (AUSTENITIC) ALLOY BASED ON Fe-Al-Mn-C SYSTEM (studies performed on an Fe-Al-C-Mo-W-V base alloy containing additions of nickel and copper indicated that copper lowered stress-rupture properties and improved oxidation resistance. Nickel additions increased stress rupture and room temperature tensile properties of the base alloy but had little effect on oxidation resistance), by Gibson. Bimonthly prog. rept. no. 3 1960. 11p.
Order from LC mi$2.40 ph$3.30 PB 148785

General Electric Co., Cinnati, Ohio
DEVELOPMENT OF HIGH STRENGTH MATERIALS FOR SOLID ROCKET MOTORS (includes heat resistant alloys - development), by Bamberger. Annual rept. 1959. 136p.
Order from LC mi$6.90 ph$21.30 PB 148927

Climax Molybdenum Co. of Michigan, Detroit
DEVELOPMENT OF TUNGSTEN-BASE ALLOYS, by Semchyshen and Barr. Interim rept. no. 2 1959. 18p.
Order from LC mi$2.40 ph$3.30 PB 149991

Materials Adv. Board, National Research Council, Washington, D. C.
COMMITTEE ON REFRACTORY METALS (includes heat resistant alloys - development and airframes - materials):
Volume I. Summary. 1959. 40p.
Order from LC mi$3.00 ph$6.30 PB 150077-1
Volume II. Panel reports. 1959. 331p.
Order from LC mi$11.10 ph$51.60 PB 150077-2

U.S. Naval Research Laboratory.
PROPOSED MECHANISM FOR THE STRENGTHENING OF SAP-TYPE ALLOYS (includes aluminum alloys), by Ansell. 1958. 4p.
Order from OTS at 50 cents PB 151047

Defense Metals Information Center, Battelle Memorial Inst., Columbus, Ohio.
METHODS FOR CONDUCTING SHORT-TIME TENSILE, CREEP, AND CREEP-RUPTURE TESTS UNDER CONDITIONS OF RAPID HEATING (this report reviews the equipment and testing methods used by 15 different organizations in the tensile and short-time creep testing of materials under conditions of rapid heating), by Moon and Simmons. 1959. 43p.
Order from OTS at $1.25 PB 151078

Mich. Univ. Engineering Research Inst., Ann Arbor
EFFECT OF PRIOR CREEP ON MECHANICAL PROPERTIES OF AIRCRAFT STRUCTURAL METALS. Part III: -C110M TITANIUM ALLOY, by Gluck, Voorhees and Freeman. 1958. 97p
Order from OTS at $2.25 PB 151145

Defense Metals Information Center, Battelle Memorial Inst., Columbus, Ohio
STRUCTURAL DAMAGE IN THERMALLY CYCLED RENE 41 AND ASTROLOGY SHEET MATERIALS (stress-rupture life at 1650 F and tensile properties at room temperature and at 1400 F were used to determine the extent of structural damage in thermally cycled Rene 41 and Astrology sheet materials), by Moon, VanEcho and others. 1950. 27p.
Order from OTS at 75 cents PB 151083

SELECTED SHORT-TIME TENSILE AND CREEP DATA OBTAINED UNDER CONDITIONS OF RAPID HEATING (data are given for 28 alloys in sheet form, including 3 aluminum alloys, 6 titanium alloys, 2 alloy steels, 3 tool steels, 6 Cr-Ni-Fe alloys, and 8 superalloys of general interest. In addition, an extensive bibliography contains references to 121 reports and articles pertaining to test methods and equipment and to very-short-time data for these and many other materials), by Moon and Simmons. 1960. 88p.
Order from OTS at $2.25 PB 151088

DESIGN INFORMATION OF NICKEL-BASE ALLOYS FOR AIRCRAFT AND MISSILES (tensile, compressive, shear, and bearing properties of some nickel-base alloys for aircraft and missiles have been assembled and evaluated), by Favor, Roberts and Achbach. 1960. 153p
Order from OTS at $3.00 PB 151090

DESIGN INFORMATION ON PH 15-7 Mo STAINLESS STEEL FOR AIRCRAFT AND MISSILES (this report is a summary of design information pertinent to the use of PH 15-7 Mo stainless steel in aircraft and missile applications. Welding problems are discussed briefly. Data on the elevated-temperature mechanical properties of this alloy have been collected and evaluated. The presentation and evaluation of these data are in accordance with procedures employed by the ANC-5 Committee), by Favor, Deel and Achbach. 1960. 43p.
Order from OTS at 1.25 PB 151093

Battelle Memorial Institute, Columbus, Ohio
COMPRESSIVE CREEP BUCKLING OF METAL COLUMNS. Part 5: CYCLIC LOADING (includes aluminum and titanium alloys), by Manning. 1958. 69p.
Order from OTS at $1.75 PB 151218

Central Inst. for Industrial Research (Norway)
OXIDATION OF TITANIUM, by Hurlen, Kjollesdal and others. Final tech. rept. 1958. 119p.
Order from OTS at $2.50 PB 151236

NBS, Washington, D.C.
OXIDATION OF EXPERIMENTAL ALLOYS (a study was made of the oxidation resistance of ten high-temperature alloys; 1) Aluminum modified Nichrome V, 2) Nichrome V, 3) niobium modified Nichrome V, 4) an iron-chromium-aluminum alloy, 5) inconel 702, 6) Hastelloy R235, 7) Hastelloy W, 8) type 316 stainless steel, 9) Inconel X, and 10) Inconel), by Richmond and Thornton. 1958. 54p.
Order from OTS at $1.50 PB 151264

Minnesota U., Minneapolis
EFFECT OF STATIC PRESTRAIN ON THE PROTFATIGUE PROPERTIES OF UNNOTCHED AND NOTCHED MATERIALS AT ROOM AND ELEVATED TEMPERATURE (of the alloys 7075-T6 extruded, 2024-T4 extruded, 16-25-6 hot-cold-worked, and S-816 solution treated and aged), by Vitovec. 1958. 68p.
Order from OTS at $1.75 PB 151280

Engineering Research Inst., U. of Mich., Ann Arbor
AN INVESTIGATION OF THE RELATIONSHIP BETWEEN MICROSTRUCTURE AND CREEP-RUPTURE PROPERTIES OF HEAT-RESISTANT ALLOYS (using nickel and A-286 alloy as material), by Coldren and Freeman. 1958. 71p.
Order from OTS at $2.00 PB 151421

Thomson Lab., General Electric Co.
EVALUATION OF ALLOYS FOR HIGH TEMPERATURE GEAR APPLICATIONS (the selection of materials for use in high Mach number aircraft gears requires consideration of high temperature physical, mechanical and chemical properties, and of rubbing compatibility. This program was designed to obtain bench test data on ten different materials for application as gears at operating temperatures to 700°F), by Jackson, Muench and others. 1958. 86p.
Order from OTS at $2.25 PB 151625

Research Inst., U. of Mich., Ann Arbor
ELECTRON METALLOGRAPHIC STUDIES OF NICKEL-BASE HEAT-RESISTANT ALLOYS, by Bigelow and Amy. 1958. 57p.
Order from OTS at $1.50 PB 151537

Minnesota U., Minneapolis
FATIGUE, CREEP, AND RUPTURE PROPERTIES OF THE ALLOYS UDIMET 500, HASTELLOY R-235, AND GMR-235 (fatigue, rupture, and creep data at 1200° and 1650°F obtained under various combinations of mean and alternating stress are presented), by Vitovec. 1958. 72p.
Order from OTS at $2.00 PB 151608

Thomson Lab., General Electric Co.
EVALUATION OF ALLOYS FOR HIGH TEMPERATURE GEAR APPLICATIONS (program was designed to obtain bench test data on ten different materials for application as gears at operating temperatures to 700°F), by Jackson, Muench and others. 1958. 86p.
Order from OTS at $2.25 PB 151625

Mich. Univ. Research Inst., Ann Arbor
NOTCH SENSITIVITY OF AIRCRAFT STRUCTURAL AND ENGINE ALLOYS. Part II. FURTHER STUDIES WITH A-286 ALLOY, by Voorhees and Freeman. 1959. 67p.
Order from OTS at $1.75 PB 15_738

Metcut Research Associates, Cincinnati, Ohio
MACHINING CHARACTERISTICS OF HIGH STRENGTH THERMAL RESISTANT MATERIALS. Phase I. SURVEY OF EXISTING INFORMATION; ISOLATION OF PROBLEMS (the purpose is to investigate and evaluate the machining characteristics of high strength, thermal resistant materials on which present aircraft design and future construction is based. Phase I comprises an industrial and a literature survey designed to ascertain the types of parts intended for future aircraft, the alloys to be used for these parts, and the machining problems associated with their manufacture), by Nowikowski and Koster. 1958. 157p.
Order from OTS at $3.00 PB 151774

Stanford Research Inst., Menlo Park, Calif.
MECHANICAL PROPERTIES AND OXIDATION RESISTANCE OF CERTAIN REFRACTORY METALS (a handbook of various mechanical thermal and oxidation properties of the refractory metals; chromium, columbium, osmium, rhenium, tantalum, tungsten, vanadium and their alloys), by Tietz, Wilcox and Wilson. Final rept. 1959. 239p.
Order from OTS at $3.50 PB 151855

Defense Metals Information Center, Battelle Memorial Inst., Columbus, Ohio
THE PROPERTIES OF MAGNESIUM-THORIUM ALLOYS (it is the purpose of this memorandum to present available engineering data for magnesium-thorium alloys of interest for structural applications of high-speed manned aircraft, which are commercially produced or have reached an advanced developmental stage. In addition, limited attention is given to fabrication of the alloys and design requirements that favor their selection), by Jackson. 1959. 29p.
Order from OTS at 50 cents PB 161170

PROCEDURES FOR ELECTROPLATING COATINGS ON REFRACTORY METALS (refractory metals covered are: vanadium, columbium, tantalum, tungsten, titanium, and molybdenum), by Beach and Gurklis. 1959. 28p.
Order from OTS at 50 cents PB 161185

PROCEDURES FOR THE METALLOGRAPHIC PREPARATION OF BERYLLIUM, TITANIUM, AND REFRACTORY METALS (it is the purpose of this memorandum to provide some basic information for such companies who wish to establish and practice satisfactory procedures for the metallographic preparation of the following metals: beryllium; chromium; columbium; molybdenum; platinum group: platinum, palladium, ruthenium, rhodium, iridium, and osmium; rhenium; tantalum; titanium; tungsten; and vanadium), by Buchheit and Wheeler. 1959. 38p.
Order from OTS at 50 cents PB 161187

THE WELDING OF WROUGHT AGE-HARDENABLE NICKEL-BASE ALLOYS FOR SERVICE AT ELEVATED TEMPERATURES, by Lepowski and Monroe. 1959. 21p.
Order from OTS at 50 cents PB 161188

A BRIEF REVIEW OF REFRACTORY METALS (in this paper the refractory metals will be taken as the metals with melting points equal to or higher than that of chromium, 1875 C), by Jaffee. 1959. 37p.
Order from OTS at 50 cents PB 161190

SELECTED REFERENCES ON MAKING HIGH-TEMPERATURE ALLOYS BY POWDER METALLURGY (includes bibliography - powder metallurgy), by Barth. 1960. 6p.
Order from OTS at 50 cents PB 161197

SELECTED REFERENCES TO ASTIA DOCUMENTS ON MACHINING (bibliography), by Boulger and Gold. 1960. 51p.
Order from OTS at 50 cents PB 161211

RECENT DEVELOPMENTS IN SUPERALLOYS (development of over a dozen new nickel-base and cobalt-base materials. Some of these alloys are fabricable into sheet, while others are suitable only for precision casting), by Wagner. 1960. 14p.
Order from OTS at 50 cents PB 161214

MATERIALS-PROPERTY-DESIGN CRITERIA FOR METALS. Part 8. THE CREEP BEHAVIOR OF SELECTED MATERIALS IN THE RANGE UP TO 1 PER CENT NET CREEP STRAIN AND 1000 HOURS (the objectives of this study were to compile and to evaluate creep strain versus time data on airframe structural materials. The range of interest, as recommended by the Elevated Temperature Task Group of the ANC-5 Panel, includes creep strain up to 1 per cent and time up to 1000 hours), by Favor, Achbach and Grover. 1959. 30p.
Order from OTS at 75 cents PB 161302

Crucible Steel Co. of America, Pittsburgh, Pa.
DEVELOPMENT OF HIGH-TEMPERATURE IRON-BASE ALLOYS (at temperatures approaching 1200 F), by Kasak, Chandhok and Dulis. 1959. 71p.
Order from OTS at $2.00 PB 161337

DEVELOPMENT OF A CORROSION-RESISTANT BEARING STEEL FOR SERVICE IN AIRCRAFT AT TEMPERATURES UP TO 1000 F, by Steven and Philip. 1959. 70p.
Order from OTS at $1.75 PB 161338

NBS, Washington, D.C.
PREPARATION OF HIGH PURITY W, Mo, Ta, Cb, AND Zr, by Moore and Wyman. 1959. 15p.
Order from OTS at 50 cents PB 161365

Climax Molybdenum Co. of Michigan, Detroit
DEVELOPMENT OF MOLYBDENUM-BASE ALLOYS. Part I. HIGH STRENGTHS AND HIGH RECRYSTALLIZATION TEMPERATURES IN WROUGHT MOLYBDENUM-BASE ALLOY BAR STOCK. Part II. MOLYBDENUM-BASE ALLOY SHEET MATERIALS (these represent the strongest known metallic materials for service at 1800°F to 2400°F), by Semchyshen, Barr and McArdle. 1959. 138p.
Order from OTS at $2.75 PB 161413

Thiokol Chemical Corp., Trenton, N.J.
A STUDY OF THE CORROSIVE EFFECTS OF THE COMBUSTION PRODUCTS OF BORON CONTAINING FUELS ON SELECTED HIGH TEMPERATURE MATERIALS (the data show that for all alloys there exists a critical temperature (Tc) in the range 1600 to 2000°F above which the corrosion rate increases very rapidly with increasing temperature, and above which serious pitting, and even destruction, occurs within 150 hours), by Loprest and Tunkel. 1959. 331p.
Order from OTS at $5.00 PB 161421

Manufacturing Labs., Inc., Cambridge, Mass.
INVESTIGATION OF THE STRENGTH AND DUCTILITY RELATIONSHIPS IN TITANIUM-ALUMINUM ALLOYS BETWEEN 6 AND 15% ALUMINUM FOR APPLICATION AT ELEVATED TEMPERATURES, by Lement, Hahn and Kreder. 1958. 74p.
Order from OTS at $1.75 PB 161424

Watertown Arsenal Labs., Mass.
TEMPERATURE GRADIENT: HARDNESS TECHNIQUE FOR DETERMINATION OF RECRYSTALLIZATION TEMPERATURE, by Dhosi and Pierson. 1960. 22p.
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Materials Research Corp., Yonkers, N.Y.
THE INVESTIGATION OF THE MECHANISM OF SUBSTRUCTURAL FORMATION IN REFRACTORY METALS AND THE RELATION TO THE OBSERVED MECHANICAL PROPERTIES (includes molybdenum-microstructure), by Iannicci, Intrater and others. 1960. 32p.
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Marquardt Corp., Van Nuys, Calif.
SHORT TIME, ELEVATED TEMPERATURE, STRESS-STRAIN BEHAVIOR OF TENSILE, COMPRESSIVE AND COLUMN MEMBERS (the short time tension and compression properties of four aircraft sheet materials were evaluated at room and elevated temperatures at strain rates ranging from 0.00001 to 0.1 in./in./sec), by Bernett. 1959. 144p.
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Allison Div., Gen. Motors Corp., Indianapolis
EFFECT OF BORON CONTAINING HIGH ENERGY FUEL COMBUSTION PRODUCTS ON THE PROPERTIES OF STATICALLY STRESSED HIGH TEMPERATURE ALLOYS, by Vonnegut and Mahler. 1960. 70p.
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NOL, White Oak, Md.
SOME ELEVATED TEMPERATURE PROPERTIES OF PRECIPITATION HARDENABLE IRON-ALUMINUM ALLOYS (the effects of titanium and titanium plus carbon on some of the elevated temperature properties of the binary iron-aluminum alloys were studied), by Buehler and Dalrymple. 1960. 19p.
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Mich. Univ. Research Inst., Ann Arbor
STUDIES OF HEAT-RESISTANT ALLOYS, by Coldren, White and others. 1960. 108p.
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Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
INVESTIGATION OF THE COMPRESSIVE, BEARING, AND SHEAR CREEP-RUPTURE PROPERTIES OF AIRCRAFT STRUCTURAL METALS AND JOINTS AT ELEVATED TEMPERATURES (this report summarizes in tabular and chart form the high temperature short time deformation properties of 16 V - 2.5 Al titanium alloy and Vascojet 1000 alloy steel in tension, compression, bearing and shear), by Yerkovich. 1960. 111p.
Order from OTS at $2.50 PB 161717

Lubrication Lab., MIT., Cambridge, Mass.
FRICTION AND WEAR AT ELEVATED TEMPERATURES (a new high-temperature friction apparatus has been constructed which allows sliding experiments to be carried out at temperatures to 2000 F. in controlled atmospheres, and at speeds varying over a wide range) by Rabinowicz. 1960. 25p.
Order from OTS at 75 cents PB 161719

Bell Aircraft Corp., Buffalo, N.Y.
MECHANICAL PROPERTIES OF SELECTED ALLOYS AT ELEVATED TEMPERATURES. Part II. DESIGN CRITERIA OF SILICON CARBIDE, by Pearl, Nowak and Deban. 1960. 134p.
Order from OTS at $2.75 PB 161723

N.Y. Univ. Coll. of Engineering, N.Y.
DEVELOPMENT OF PROTECTIVE COATINGS FOR REFRACTORY METALS (a preliminary study of the feasibility of protecting tungsten against oxidation at 1650°C (3000°F) was undertaken. Rhodium was selected from the noble metal group as the most promising metallic type of coating), by Goetzel, Venkatesan and Bunshah. 1960. 57p.
Order from OTS at $1.50 PB 161736

Illinois Univ, Urbana
PROTECTIVE COATINGS FOR REFRACTORY METALS (tests with tungsten wire encapsulated in evacuated fused silica tubes demonstrated the impermeability of oxygen at temperatures above 3000°F. for several hours, as evidenced by the non-oxidation of the encased tungsten), by Bergeron, Friedberg and others. 1960. 50p.
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Armour Research Foundation, Chicago, Ill.
DEVELOPMENT OF PARTIALLY VOLATILE BRAZING FILLER ALLOY FOR HIGH-TEMPERATURE APPLICATION AND RESISTANCE TO OXIDATION (the mechanisms by which remelt temperature is increased have been studied for the range of alloys investigated which contained nickel, chromium, germanium, iron, lithium, and phosphorus), by Lehrer and Schwartzbart. 1959. 45p.
Order from OTS at $1.25 PB 161746

Mich. Univ. Research Inst., Ann Arbor
NOTCH SENSITIVITY OF HIGH-TEMPERATURE ALLOYS, by Foorhees and Freeman. 1960. 55p.
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Metcut Research Associates, Inc., Cincinnati, O.
MACHINING CHARACTERISTICS OF HIGH STRENGTH THERMAL RESISTANT MATERIALS. ITEM V, PART II: MACHINING CHARACTERISTICS OF MOLYBDENUM - 0.5% TITANIUM ALLOY (a study of the machining characteristics of a molybdenum alloy containing 1/2 percent titanium (Mo-1/2% Ti) has been conducted for turning, face milling, drilling, reaming and tapping operations), by Nowikowski. 1960. 75p.
Order from OTS at $2.00 PB 161775

Climax Molybdenum Co. of Michigan, Detroit
ARC-CAST MOLYBDENUM AND TUNGSTEN BASE ALLOYS (1957-1959), by Semchyshen and Barr. 1959. 205p.
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Battelle Memorial Inst., Columbus, O.
HIGH-TEMPERATURE PROPERTIES AND ALLOYING BEHAVIOR OF THE REFRACTORY PLATINUM-GROUP METALS (a survey of the literature pertaining to the platinum-group metals and their alloys has been conducted as a part of the study of the metallurgical properties of the refractory platinum-group metals. Major emphasis was placed on the four more refractory metals: rhodium, iridium, osmium, and ruthenium. A selected bibliography and a list of references are included), by Douglass, Holden and Jaffee. Tech. phase rept. 1959. 127p.
Order from OTS at $2.75 PB 161823

Materials Lab., WADC, Wright-Patterson AFB, Ohio
INVESTIGATION OF THE UNNOTCHED AND NOTCHED FATIGUE BEHAVIOR OF SEVERAL HEAT RESISTANT MATERIALS FOR ENGINE BOLTS (for the heat resistant alloys AMS 5735(A-286), Udimet 500, and Inconel 700 and 901), by Forney and Wang. 1960. 59p.
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American Machine & Foundry Co., Alexandria, Va.
ULTRA-SHORT-TIME CREEP RUPTURE (the short time creep behavior of eight structural sheet materials when subjected to temperatures up to 2000°F was determined for time periods of 10 seconds to three minutes), by Ives. 1960. 131p.
Order from OTS at $2.75 PB 161983

Crucible Steel Co. of America, Pittsburgh, Pa.
CORROSION OF SUPERALLOYS BY SELECTED FUSED SALTS (the corrosion of Inconel X, Inconel 702, Rene 41, M-252, and Haynes 25 by potassium chloride and lithium fluoride at 1600 to 1900 F was studied), by Moskowitz and Redmerski. 1960. 84p.
Order from OTS at $2.25 PB 161848

Armour Research Foundation, Chicago, Ill.
STUDY OF FATIGUE PROPERTIES OF ULTRA-HIGH STRENGTH STEEL, by Nudelman and Sheehan. 1960. 65p.
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Curtiss-Wright Corp., Caldwell, N.J.
RESEARCH ON PROPERTIES OF HIGH STRENGTH MATERIALS SUITABLE FOR HIGH TEMPERATURE APPLICATIONS (bars of iron-molybdenum alloys, intended for study as to suitability for ball bearings at temperatures up to 1000°F, were found to be so non-homogeneous and brittle that specimens could not be machined from them. High temperature torsion tests of relaxation were made to study the suitability of two alloys, M-1 tool steel and Inconel X, for springs at 1000°F, and of 1500°F), by Cummings, Stulen and Schulte. 1960. 61p.
Order from OTS at $1.75 PB 171060

Minnesota Univ., Minneapolis
FATIGUE AND STRESS RUPTURE PROPERTIES OF INCONEL 713C, V-57C AND TITANIUM ALLOYS 7Al-3Mo-Ti AND MST 821 (8Al-2Cb-Ta-Ti), by Cers and Blatherwick. 1960. 92p.
Order from OTS at $2.25 PB 171064

Manufacturing Labs., Inc., Cambridge, Mass.
INVESTIGATION OF THE STRENGTH AND DUCTILITY RELATIONSHIPS IN TITANIUM-ALUMINUM ALLOYS BETWEEN 6 AND 15% ALUMINUM FOR APPLICATION AT ELEVATED TEMPERATURES, by Lement, Hahn and Krder. 1958. 74p.
Order from OTS at $1.75 PB 161424

TRANSLATIONS ON HEAT RESISTANT ALLOYS

PROTECTIVE COATINGS ON HIGH-TEMPERATURE STRENGTH ALLOYS (localized corrosion of high-temperature strength Ni-base alloys (such as 20% Cr, 2.4 Ti, 0.7 Al, balance Ni) for gas turbine blades, caused by presence of vanadium (pendoxide) and sodium in some fuels), by Parfenov. 1958.
Trans. of Metallovedeniye i Obrabotka Metallov (USSR) 1958, no. 6, p. 33-37.
Order as HB-4251 from HB at $4.85 59-12266

THE EFFECT OF PLASTIC DEFORMATION ON THE HEAT RESISTANCE OF THE E1437 ALLOY, by Kishkin, Klypin and Sulima. 1958. 5p.
Trans. of Metallovedeniye i Obrabotka Metallov (USSR) 1958, no. 6, p. 18-20.
Order from OTS at 50 cents 59-13154

DUCTILITY OF HIGH-TEMPERATURE STRENGTH ALLOYS AS AFFECTED BY STRUCTURE AND STRESS STATE by Rastegayev. 1958.
Trans. of Metallovedeniye i Obrabotka Metallov (USSR) 1958, no. 7, p. 30-35.
Order as HB-4280 from HB at $3.80 59-14013

PROTECTIVE COATINGS OF HEAT RESISTANT ALLOYS (results are described of investigations of the strength of specimens made of the alloy E1437B (20.10% Cr; 2.40% Ti; 0.71% Al; 0.04% C; 0.45% Si; 0.20% Mn; 0.005% S; 0.006% P; 0.60% Fe; 0.05% Cu; 0.05% zr; the rest Ni) and of the alloy E1617 (composition as per standard specification), by Parfenov. 1958. 7p.
Trans. of Metallovedeniye i Obrabotka Metallov (USSR) 1958, no. 6, p. 33-37.
Another translation is available as HB-4251, $4.85
Order from OTS at 50 cents 59-13156

CERTAIN PROBLEMS ON THE THEORY OF ALLOYING SPECIAL CAST HIGH-ALLOY ALLOYS (cooling speed, duration of hardening, completeness of feed, and free shrinkage were studied in cast high-alloy alloys, including refractory types), by Nekhendzi. 1959. 16p.
Trans. of Liteynoye Proizvodstvo (USSR) 1958, no. 10, p. 23-28.
Order from OTS at 50 cents 59-13202

MODIFICATION OF HEAT-STABLE ALLOYS WITH AN Al-Si BASE, by Orlova. 1959. 11p.
Trans. of Liteynoye Proizvodstvo (USSR) 1958, no. 4, p. 31-32.
Order from LC or SLA mi$2.40 ph$3.30 59-17623

A MACHINE FOR TESTING HEAT STRENGTH UNDER PROGRAMMATICALLY VARIED CONDITIONS (includes heat resistant alloys - testing equipment), by Gorbodey, Bulegin and others. 1959. 8p.
Trans. of an unidentified Russian mono. Instruments and Technique of Laboratory Works, p. 486-490.
Order from LC or SLA mi$1.80 ph$1.80 59-16731

HIGH-ALLOY, STAINLESS AND HEAT-RESISTANT STEELS AND ALLOYS WITH HIGH OHMIC RESISTANCE. 1959. 13p.
Trans. of Russian Standard GOST 5632-51, gr. v. 30, introduced 4 Jan 51, approved 1 Mar 51, reissued with amendments June 56.
Order from LC or SLA mi$2.40 ph$3.30 59-19161

EFFECT OF THE SURROUNDING MEDIUM ON THE STRENGTH OF HEAT-RESISTANT STEELS (data are reviewed on the effect of surface-active substances (e.g., comparatively low-melting-point metals and alloys in the liquid state(on the behaviour of polycrystalline solids under load), by Kishkin and Nikolenko. 1959. 5p.
Trans. of Akad(emiya) Nauk SSSR. Dokl(ady) 1956, v. 110, no. 6, p. 1018-1021.
Order from LC or SLA mi$1.80 ph$1.80 59-22557

ELECTRODES FOR WELDING HEAT RESISTING TUBE STEEL 1Kh18N12T, by Lazarev; tr. by M.deO. Tollemache. 1959. 15p.
Trans. of Svarochnoye Proizvodstvo (USSR) 1958, no. 5, p. 8-11.
Order from LC or SLA mi$2.40 ph$3.30 59-22658

METALLURGICAL ACHIEVEMENTS IN THE DEVELOPMENT OF HIGH-TEMPERATURE (HEAT-RESISTANT) STEELS AND ALLOYS FOR GAS TURBINE CONSTRUCTION, by Mikhaylov-Mikheyev. 1959. 14p.
Trans. of Teploenergetika (USSR) 1959 (v. 6) no. 10, p. 3-8.
Order from OTS at 50 cents 59-31049

HEAT-RESISTANT CHROMIUM-MANGANESE STEELS, by Schmidt and Legat. 1954. 16p.
Trans. of Archiv fur das Eisenhuttenwesen (Germany) 1937 (v. 10) no. 7, p. 297-306.
Order from SLA mi$2.40 ph$3.30 60-10182

THE INFLUENCE OF COMPOSITIONS, TEMPERATURE, TIME AND RESIDUAL STRESS ON HIGH TEMPERATURE AGE-HARDENING (the age-hardening phenomena of Timken 16-25-6, the heat-resisting alloy for gas turbine material, were studied by determination of hardness and microstructure). Part 1 of Study on Heat-Resisting Steel, by Asano. 1959. 15p.
Trans. of Tetsu to Hagane (Japan) 1952, v. 38, no. 5, p. 51-56.
Order from SLA mi$2.40 ph$3.30 60-10295

THE INFLUENCE OF SOLUTION TREATMENT ON GRAIN-SIZE AND HIGH TEMPERATURE AGE-HARDENING. Part 2 of Study on Heat-Resisting Steel, by Asano. 1959. 13p.
Trans. of Tetsu to Hagane (Japan) 1952, v. 38, no. 6, p. 29-33.
Order from SLA mi$2.40 ph$3.30 60-10296

THE RELATION BETWEEN TEMPERING AND STRAIN AFTER COLD WORK OR HOT-COLD WORK, IN TIMKEN 16-25-6 ALLOY (four samples of different chemical components were worked at 650°C, 900°C, and 1000°C by Amsler's tensile strength test machine). Part 3 of Study on Heat-Resisting Steel, by Asano. 1959. 19p.
Trans. of Tetsu to Hagane (Japan) 1952, v. 38, no. 7, p. 41-47.
Order from SLA mi$2.40 ph$3.30 60-10297

THE EFFECT OF TERNARY INTERMETALLIC COMPOUNDS ON THE HEAT RESISTANCE OF DEFORMED ALUMINUM ALLOYS, by Vul'f and Chernov. 1960. 10p.
Trans. of Izvestiya Vysshikh Uchebnykh Zavedeniy. Tsvetnaya Metallurgiya (USSR) 1960, no. 2, p. 147-152.
Order from OTS at 50 cents 60-11843

PROBLEMS ON THE THEORY OF HEAT RESISTANCE OF METAL ALLOYS. 1960. 255p.
Trans. of (Akademiya Nauk SSSR). Institut Fiziki Metallov, Sverdlovsk. Trudy, 1958, no. 4, p. 3-94 and 101-162.
Order from OTS at $4.00 60-11918

SOME RELATIONSHIPS IN THE HOT PRESSING OF POWDERS OF REFRACTORY COMPOUNDS (study of behavior of powders of carbides of Ti and W, and borides of Ti, Zr, and Mo in hot pressing), by Koval'chenko and Samsonov. 1960.
Trans. of Akad(emiya) Nauk SSSR. O(tdeleniye) T(ekhnicheskikh) N(auk). Tsv(estiya): Met(allurgiya) i Topl(ivo) 1959, no. [illegible], 144-147.
Order as HB-4799 from HB at $4.50 60-12824

APPLICATION OF THE DISLOCATION THEORY TO HEAT-RESISTANCE PROBLEMS, by Oding. 1958. 9p.
Trans. of Issledovaniya po Zharoprochnym Splavam (USSR) (1957) v. 2, p. 320-329.
Order from LC or SLA mi$1.80 ph$1.80 60-13052

HEAT-RESISTANT ENAMEL COATING STABLE TO THE ACTION OF MOLTEN ALUMINUM (a heat resistant enamel coating has been developed which will prevent the dissolution of iron from steel ladles, crucibles, etc., used in the melting and pouring of aluminum and some other non-ferrous metals. The composition, preparation, application and firing practice of such enamel coatings is given together with the results of tests on various coatings which indicate that complete isolation from the steel of the containers has been achieved), by Kukolev and Tarasenko. 1959. 7p.
Trans. of Liteynoye Proizvodstvo (USSR) 1959, no. 3, p. 45-46.
Order from LC or SLA mi$1.80 ph$1.80 60-13752

A STUDY OF NIMONIC BY METHODS OF INNER FRICTION, ELECTRIC RESISTANCE AND DILATOMETRIC ANALYSIS (includes nickel alloys - electrical properties), by Abraamov and Livshits. 1958. 17p.
Trans. of Issledovaniya po Zharoprochnym Splavam (USSR) 1957, v. 2, p. 198-210.
Order from LC or SLA mi$2.40 ph$3.30 60-14507

DIAGRAM COMPOSITION-HEAT RESISTANCE OF ALLOYS OF THE BINARY SYSTEM Ti-Al, by Kornilov, Pylayeva and Volkova. 1960. 7p.
Trans. of (Akademiya Nauk SSSR). Institut Metallurgii. Trudy, 1957, v. 2, p. 164-166.
Order from LC or SLA mi$1.80 ph$1.80 60-14509

PROPERTIES OF TERNARY ALLOYS OF TITANIUM, CHROMIUM AND ZIRCONIUM DIBORIDES, by Portnoy and Samsonov. 1958. 4p.
Trans. of Akademiya Nauk SSSR. Doklady, 1957, v. 116, no. 6, p. 976-978.
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PRINCIPLES OF THE ALLOYING OF HEAT RESISTANT NON-FERROUS ALLOYS, by Zakharov. 1960. 12p.
Trans. of mono. Prochnost' Metallov, Moscow, 1956, p. 80-90.
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RELATIVE EVALUATION OF THE MEANS OF CREATING ALLOYS WITH GIVEN PROPERTIES (example of Heat-Resistant Alloys), by Bochvar. 1960. 13p.
Trans. of mono. Metallovedeniye (Metallography) Moscow, 5th ed. 1956, p. 287-297.
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THE RELATION OF RELATIVE HEAT RESISTANCE TO COMPOSITION IN THE Cu-Ni-Si SYSTEM, by Novikov and Dautova. 1960. 4p.
Trans. of Akademiya Nauk SSSR. Doklady, 1957, v. 115, no. 1, p. 110-113.
Available on loan from SLA 60-16940

COMPARING YOUNG'S MODULUS WITH OTHER MECHANICAL CHARACTERISTICS OF ALUMINUM ALLOYS AT VARIOUS TEMPERATURES (as a rule, the larger the value of Young's modulus, the higher the heat-resistance of alloys. The positive effect of 0.1 to 0.15% of cadmium upon the heat-resistance of AK 4-7 type of alloys was noted), by Dzagurova, Zakharov and Sirota. 1957. 4p.
Trans. of Akademiya Nauk SSSR. Otdeleniye Tekhnicheskikh Nauk. Izvestiya, 1957, no. 2, p. 120-122.
Available on loan only from SLA 60-16964

USING THE THEORY OF DISLOCATION IN QUESTIONS OF HEAT RESISTANCE, by Oding. 1958. 15p.
Trans. of Issledovaniya po Zharoprochnym Splavam (USSR) 1957, v. 2, p. 320-328.
Another translation is available from LC or SLA mi$1.80 ph$1.80 as 60-13052, CTS-486, May 58 (9)p.
Available on loan from SLA 60-16979

HEAT RESISTANCE OF CERTAIN BINARY, TERNARY, QUATERNARY, AND QUINARY NICKEL SYSTEMS AT 800°C, by Kornikov and Pryakhina. 1957. 5p.
Trans. of Akademiya Nauk SSSR. Doklady, 1957, v. 112, no. 1, p. 70-72.
Available on loan from SLA 60-16987

THE EFFECTS OF ALLOYING ELEMENTS ON THE HEAT RESISTANCE OF ALLOYS AND COHESIVE FORCE IN LATTICES OF THE OXIDE PHASES IN SCALE. 1. THE EFFECT OF CHROMIUM ON THE COHESIVE FORCES IN HEMATITE, by Arkharov and Borisov. 1960. 13p.
Trans. of Fizika Metallov i Metallovedeniye (USSR) 1956, v. 3, no. 3, p. 471-476.
Available on loan from SLA 60-16990

INFLUENCE OF VARIOUS ALLOYING ELEMENTS ON THE PROPERTIES OF HEAT-RESISTING AUSTENITIC CHROMIUM-NICKEL STEELS BETWEEN 600° and 700°C, by Vogels. 1956. 20p.
Trans. of Stahl und Eisen (West Germany) 1955, v. 75 (no. 9) p. 559-570.
Order from SLA mi$2.40 ph$3.30 60-18259

TWO CONTROLLED ATMOSPHERE CHAMBERS FOR WELDING REFRACTORY METALS, by Ol'shanskiy, Mordvintseva and others. 1960. 8p.
Trans. of Avtomaticheskaya Svarka (USSR) 1958, v. 11, no. 11, p. 32-36.
Order from LC or SLA mi$1.80 ph$1.80 60-19571

CLASSIFICATION OF SOVIET GAS-TURBINE STEELS. 1959. 17p.
Trans. from Soviet open sources 1954-59.
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CLASSIFICATION OF SOVIET GAS-TURBINE STEELS (the Soviet definition of heat-resistant steels covers 2 major classifications (heat-proof and heat-stable or scale-resistant). 1959. 17p.
Trans. from Soviet open sources 1954-59.
Order from OTS at 50 cents 60-21016 rev.

METALLOGRAPHIC INVESTIGATIONS ON X8 CrNiNb 1613 AFTER CREEP TESTS AT 750°C, by Schrader and Krisch. 1960.
Trans. of mono. (papers) presented at the international discussions on Long Time Behaviour of High Temperature Steels, held in Dusseldorf, 24-25 June 60.
Order as BISITS-1803 from BISI £ 6 10s

EFFECT OF SULFUR ON THE MECHANICAL AND HEAT PROPERTIES OF PEARLITIC CAST STEEL 15KhlM1FB, Silayev and Dubrovskaya. 1960.
Trans. of *Metallov(edeniye i) Term(icheskaya) Obra(botka) Met(allov) (USSR), 1959, no. 5, p.40-44.
Order as HB-4583 from HB at $2.00 60-25220

PHASE ANALYSIS OF HEAT RESISTING CONSTRUCTIONAL STEELS, by Alekseyenko, Lashko and others. 1960.
Trans. of *Metallov(edeniye i) Term(icheskaya) Obra(botka) Met(allov) (USSR) 1959, no. 5, p.52-54.
Order as HB-4586 from HB at $2.00 60-25223

RARE ELEMENTS AS ALLOYING ADDITIVES TO HEAT-RESISTANT STEEL, by Semenova. 1960. 18p.
Trans. of Akademiya Nauk Latviyskoy SSR, Riga. Izvestiya, 1959, no. 11(48), p. 47-54.
Order from OTS at 50 cents 60-31226

ENDURANCE CRITERION FOR CERTAIN HEAT-RESISTANT ALLOYS UNDER COMBINED STRESSES (data are cited from tests conducted on the alloy EI-437B (different melts and billets) under simultaneous combined stresses of tension and torsion at temperatures of 600°, 700° and 750°C. An additional test was made with alloy EI-405 at 650°C), by Sdobyrev. 1960. 19p.
Trans. of Akademiya Nauk SSSR. Otdeleniye Tekhnicheskikh Nauk. Izvestiya: Mekhanika i Mashinostroyeniye, 1959, no. 6, p. 93-99.
Order from OTS at 50 cents 60-31127

RARE ELEMENTS AS ALLOYING ADDITIVES TO HEAT-RESISTANT STEEL (includes titanium, vanadium and niobium - metallurgical effects), by Semenova. 1960. 18p.
Trans. of Akademiya Nauk Latviyskoy SSR, Riga. Izvestiya, 1959, no. 11(148), p. 47-54.
Order from OTS at 50 cents 60-31226

SOME PROBLEMS IN THE THEORY OF HEAT RESISTANCE AND DEVELOPMENT OF NEW HIGH STRENGTH TITANIUM ALLOYS, by Kornilov. 1960. 20p.
Trans. of Akademiya Nauk SSSR. O(tdeleniye) T(ekhnicheskikh) N(auk). Izvestiya: Metallurgiya i Toplivo, 1959, no. 4, p. 190-199.
Order from OTS at 50 cents 60-31293

REVIEW OF M.L. BERNSHTEYN'S STEELS AND ALLOYS FOR WORKING AT HIGH TEMPERATURES (includes heat resistant alloys - analysis), by Oding and Aronovich. 1958. 3p.
Trans. of Metallovedeniye i Obrabotka Metallov, 1958, no. 2, p. 56-57.
Order from OTS at 50 cents PB 141294T

X-RAY INVESTIGATION OF THE STRUCTURE AND LATTICE PARAMETERS OF MAGNESIUM-LITHIUM-ALUMINUM TERNARY ALLOYS AT ROOM TEMPERATURE AND AT 600°F, by Towner. 1950. 39p.
Order from LC mi$2.25 ph$5.00 PB 110478

NRL, Washington, D.C.
THERMAL AND RELATED PHYSICAL PROPERTIES OF MOLTEN MATERIALS. Part II: HIGH TEMPERATURE REACTIONS OF SODIUM HYDROXIDE, by Williams and Miller. 1955. 65p
Order from OTS at $1.75 PB 111883

Utah. Univ. Dept. of Metallurgy.
ABSTRACT COMPILATION OF THE LITERATURE ON HIGH TEMPERATURE OXIDATION OF METALS, by Fassell, Peterson and Chamberlain. Tech. rept. no. III, part I. n.d. 353p.
Order from LC mi$9.00 ph$45.00 PB 113029

ABSTRACT COMPILATION OF THE LITERATURE ON HIGH TEMPERATURE OXIDATION OF METALS, by Fassell, Peterson and Chamberlain. Tech. rept. no. III, part II n.d. 319p.
Order from LC mi$9.00 ph$40.00 PB 113030

Temple Univ. Research Inst., Philadelphia, Pa.
HIGH TEMPERATURE PROJECT (includes aluminum powders; combustion and titanium powders - measuring equipment), by Conway and Grosse. 8th prog. rept. 1953. 33p.
Order from LC mi$3.00 ph$6.30 PB 118900

Rensselaer Polytechnic Institute. Dept. of Metallurgical Engineering, Troy, N.Y.
CREEP BEHAVIOR OF MAGNESIUM AND MAGNESIUM ALLOY SINGLE CRYSTALS AT ROOM AND ELEVATED TEMPERATURES, by Sheely and Nash. Quart. rept. no. 3 1955. 8p.
Order from LC mi$1.80 ph$1.80 PB 120323

Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment.
HIGH TEMPERATURE ADIABATIC CALORIMETER AND THE SPECIFIC HEAT OF URANIUM BETWEEN 100° and 800°C, by North. 1956. 21p.
Order from BIS at 64 cents PB 123597

Utah. Univ. Dept. of Metallurgy, Salt Lake City, U.
ABSTRACT COMPILATION OF THE LITERATURE ON HIGH TEMPERATURE OXIDATION OF METALS. Report III, Part III, by Fassell and Peterson. 1954. 169f
Order from LC mi$7.80 enl pr$27.30 PB 123814

Princeton Univ. James Forrestal Research Center, Princeton, N.J.
HIGH TEMPERATURE OXIDATION OF IRON-NICKEL ALLOYS, by Brabers and Birchenall. 1957. 23p.
Order from LC mi$2.70 ph$4.80 PB 126520

Temple Univ. Research Inst., Philadelphia, Pa.
HIGH TEMPERATURE PROJECT (includes titanium, calcium powders - combustion; metals - ignition temperature), by Conway and Kirshenbaum. 9th prog. rept. 1954. 35p.
Order from LC mi$3.00 ph$6.30 PB 126906

HIGH TEMPERATURE PROJECT (includes flame, oxy--aluminum radiation - measurement; aluminum powders - combustion; silicon powders - combustion; carbon powders - combustion), by Conway and Grosse. 7th prog. rept. 1953. 28p.
Order from LC mi$2.70 ph$4.80 PB 126907

Utah. Univ. Dept. of Metallurgy, Salt Lake City
HIGH TEMPERATURE-HIGH PRESSURE OXIDATION OF PURE METALS IN OXYGEN. Final report, by Baur, Bridges and others. 1955. 13p.
Order from LC mi$2.40 ph$3.30 PB 127349

National Adv. Committee for Aeronautics (NASA)
INFLUENCE OF CRUCIBLE MATERIALS ON HIGH TEMPERATURE PROPERTIES OF VACUUM MELTED NICKEL-CHROMIUM-COBALT ALLOY, by Decker and Rowe. 1957. 34p.
Order from NASA (TN 4049) PB 127525

Arkansas Univ., Fayetteville
HIGH-TEMPERATURE CHEMISTRY OF FUSED SUBSTANCES (includes metals - electro-deposition). Final report, by Kruh. 1957. 88p.
Order from LC mi$4.80 ph$13.80 PB 128076

Lubrication Lab., MIT., Cambridge
THE FRICTIONAL PROPERTIES OF TITANIUM AT HIGH TEMPERATURES, by Rabinowicz and Kingsbury. Annual rept. 1956. 26p.
Order from LC mi$2.70 ph$4.80 PB 128167

Rensselaer Polytechnic Institute, Troy, N.Y.
CREEP BEHAVIOR OF MAGNESIUM AND MAGNESIUM ALLOY SINGLE CRYSTALS AT ROOM AND ELEVATED TEMPERATURES, by Sheely and Nash. 1955. 111p.
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National Adv. Committee for Aeronautics (NASA)
INVESTIGATION OF THE COMPRESSIVE STRENGTH AND CREEP LIFETIME OF 2024-T3 ALUMINUM-ALLOY PLATES AT ELEVATED TEMPERATURES, by Mathansen and Deveikis. 1957. 14p.
Order from NASA (TN 1308) PB 130281

EFFECT OF ENVIRONMENTS OF SODIUM HYDROXIDE, AIR AND ARGON ON THE STRESS-RUPTURE PROPERTIES OF NICKEL AT 1500°F, by McHenry and Probst. 1958. 23p.
Order from NASA (TN 3987) PB 130292

Fairchild Engine & Airplane Corp. NEPA Div., Oak Ridge, Tenn.
HIGH TEMPERATURE REACTIONS IN THE SYSTEM SiC - SiO_2, by Elmer. 1950. 14p.
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Case Inst. of Tech. Dept. of Metallurgical Engineering, Cleveland, O.
HIGH TEMPERATURE SCALING OF Ni-Cr, Fe-Cr, Cu-Cr AND Cu-Mn ALLOYS, by Barrett, Evans and Baldwin. 1955. 66p.
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Naval Air Material Center, Philadelphia, Pa.
EVALUATION OF "APMP" GRADE-257 WITH RESPECT TO CREEP-RUPTURE AND TENSILE PROPERTIES AT 600°F and 800°F ROOM TEMPERATURE TENSILE PROPERTIES AND STRESS CORROSION SUSCEPTABILITY, by Emmons. 1955. 23p
Order from LC mi$2.70 ph$4.80 PB 130955

Midland Industrial Finishes Co., Waukegan, Ill.
HIGH TEMPERATURE PROTECTIVE COATINGS FOR MAGNESIUM, by Fitzgibbon, Miller and Glaser. 1957. 112p.
Order from OTS at $3.00 PB 131073

Battelle Memorial Institute, Columbus, O.
EFFECT OF ELEVATED TEMPERATURE ON THE FATIGUE STRENGTH OF SINTERED-ALUMINUM POWDER, by Hyler and Grover. 1955. 50p.
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Case Inst. of Tech., Cleveland, O.
HIGH TEMPERATURE BRITTLENESS IN TITANIUM ALLOYS, by Markrides and Baldwin. 1957. 29p.
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Armour Research Foundation, Chicago, Ill.
DEVELOPMENT OF TITANIUM-BASE ALLOYS FOR ELEVATED TEMPERATURE APPLICATION, by Crossley, Carew and Levinson. 1957. 66p.
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DETERMINATION OF THE TENSILE, COMPRESSIVE AND BEARING PROPERTIES OF FERROUS AND NONFERROUS STRUCTURAL SHEET MATERIALS AT ELEVATED TEMPERATURES (includes aluminum, magnesium alloys and titanium - mechanical properties), by Miller. 1957. 103p.
Order from OTS at $2.50 PB 131595

Southern Research Inst., Birmingham, Ala.
DETERMINATION OF THE MECHANICAL PROPERTIES OF AIRCRAFT-STRUCTURAL MATERIALS AT VERY HIGH TEMPERATURES AFTER RAPID HEATING (the materials involved in this investigation included electrolytic-tough-pitch copper, oxygen-free high-conductivity copper, A-nickel, ingot iron, molybdenum, tantalum, Type GBH graphite, and composite OFHC copper plus 316 stainless steel sheet. The testing temperatures ranged from room temperature to the melting points of the metals and to 5750°F for the graphite), by Preston, Roe and Kattus. 1958. 207p.
Order from OTS at $3.00 PB 131664

Armour Research Foundation, Chicago, Ill.
DISPERSION HARDENING OF SINTERED TITANIUM ALLOYS BY REFRACTORY METAL POWDER ADDITIONS (A study of powder metallurgical techniques for improving the impact properties of the Ti-3% Al alloy which has excellent strength and corrosion resistance at high temperatures). Final rept. 1958. 47p.
Order from OTS at $1.25 PB 131937

National Adv. Committee for Aeronautics (NASA)
MEASUREMENTS OF TOTAL HEMISPHERICAL EMISSIVITY OF VARIOUS OXIDIZED METALS AT HIGH TEMPERATURE, by Wade. 1958. 43p.
Order from NASA (TN 4206) PB 132379

NRL, Washington, D.C.
THE SUITABILITY OF PLATINUM, MOLYBDENUM, TANTALUM, AND TUNGSTEN AS HIGH-TEMPERATURE LENGTH STANDARDS (In view of the increasing need for high-temperature length standards to be used in the design and calibration of apparatus for high temperatures, the thermal expansion data available in the literature for platinum, molybdenum, tantalum, and tungsten have been critically evaluated), by White. 1958. 19p
Order from LC mi$2.40 ph$3.30 PB 132840

MIT., Cambridge, Mass.
CREEP DEFORMATION OF MAGNESIUM AT ELEVATED TEMPERATURES BY NON-BASAL SLIP, by Chaudhuri, Chang and Grant. 1954. 31p.
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Mich. Univ., Ann Arbor, Mich.
HIGH-TEMPERATURE PROPERTIES OF FOUR LOW-ALLOY STEELS FOR JET-ENGINE TURBINE WHEELS. 121p.
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National Adv. Committee for Aeronautics (NASA)
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Order from NASA (TN 4348) PB 134823

National Adv. Committee for Aeronautics (NASA)
PHENOMENOLOGICAL RELATION BETWEEN STRESS, STRAIN RATE, AND TEMPERATURE FOR METALS AT ELEVATED TEMPERATURES, by Stowell. 1958. 8p.
Order from GPO as rept. NACA TN 1343 at 15 cents PB 135305

Research Inst., Temple Univ., Philadelphia, Pa.
HIGH TEMPERATURE PROJECT (An experimental study of the combustion of the metals Mg, Ca, Al, Ti, Zr, and Na in oxygen, at atmospheric and higher pressures), by Grosse. Prog. rept. 2 1950. 53p.
Order from LC mi$3.60 ph$9.30 PB 135477

Northrop Aircraft, Inc., Hawthorne, Calif.
STABILITY OF TITANIUM CARBIDE IN HYDROGEN AT ELEVATED TEMPERATURES (It appears that titanium carbide is certainly stable in hydrogen at temperatures below 2000°C. and probably sufficiently stable for most purposes in hydrogen at temperatures up to 2400°C), by Ohlinger. 1948. 30p.
Order from LC mi$2.70 ph$4.80 PB 135661

STABILITY OF TANTALUM NITRIDE IN HYDROGEN AT ELEVATED TEMPERATURES, by Ohlinger. 1953. 20p.
Order from LC mi$2.40 ph$3.30 PB 135662

STABILITY OF TANTALUM CARBIDE IN HYDROGEN AT ELEVATED TEMPERATURES IN THE PROGRAM ON THE STABILITY OF REFRACTORY ELEMENTS AND COMPOUNDS IN A HYDROGEN ATMOSPHERE AT ELEVATED TEMPERATURES, by Ohlinger. 1957. 21p.
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STABILITY OF MOLYBDENUM CARBIDE IN HYDROGEN AT ELEVATED TEMPERATURES, by Ohlinger. 1957. 17p.
Order from LC mi$2.40 ph$3.30 PB 135682

Utah Univ., Salt Lake City
HIGH TEMPERATURE OXIDATION OF METALS (Experimental studies on the oxidation of tantalum and zirconium), by Fassell:
Prog. rept. no. 1 1952. 11p.
Order from LC mi$2.40 ph$3.30 PB 135709
Prog. rept. no. 2 1952. 11p.
Order from LC mi$2.40 ph$3.30 PB 135710
Prog. rept. no. 3 1952. 12p.
Order from LC mi$2.40 ph$3.30 PB 135711

National Adv. Committee for Aeronautics (NASA)
A PHENOMENOLOGICAL THEORY FOR THE TRANSIENT CREEP OF METALS AT ELEVATED TEMPERATURES (In this theory, a metal consisting of two phases, each with its own elasticity and viscosity, will exhibit transient creep after application of a constant stress. A comparison of the transient creep curves resulting from this theory with experimental data on four different metals shows that the entire family of creep curves for any one metal are given by the theory using a single set of constants appropriate to that metal), by Stowell. 1958. 31p.
Order from NASA (TN-4396) PB 135793

Naval Ordnance Test Station, China Lake, Calif.
RAPID-HEATING STRESS-RUPTURE PROPERTIES OF SEVERAL ENGINEERING ALLOYS (Equipment and technique for making Rapid-Heating-Rate Stress-Rupture test on AISI 1015 steel, 18-8, and Inconel X at their respective service temperatures), by Robinson and Ramsdell. 1953. 24p.
Order from LC mi$2.70 ph$4.80 PB 136207

Naval Boiler and Turbine Lab., Philadelphia, Pa.
FUEL OIL ASH CORROSION RESISTANCE OF 60:40 CHROMIUM-IRON ALLOY (Using high vanadium and high sodium corrodents at 1700°, 2000° and 2200°F., 60Cr:40Fe alloy showed the best corrosion resistance followed by 60Cr:40Ni then 50Cr:50Ni and the least resistance was displayed by 25Cr:20Ni. Utilization of the 60Cr:40Fe alloy for boiler parts is doubtful because of poor oxidation resistance), by Witmeyer. 1957. 21p
Order from LC mi$2.70 ph$4.80 PB 136267

Materials Adv. Board, National Research Council, Washington, D.C.
RESULTS OF TESTS EVALUATING COMPRESSION TESTING TECHNIQUES OF SHEET MATERIALS AT ELEVATED TEMPERATURES (includes titanium alloys - test methods), by Gerard, Gordon and others. 1958. 23p.
Order from LC mi$2.70 ph$4.80 PB 136402

UNIFORM TESTING PROCEDURES FOR SHEET MATERIALS. PART 1. GENERAL PROCEDURES. PART 2. TENSION TEST (Uniform testing techniques for high-temperature design is needed. To provide some basis for uniformity in evaluating various titanium alloys, a uniform set of procedures is being prepared for procuring the data. Adherence to these procedures will make it possible for several laboratories to perform the tests and the data can then be compared on a uniform basis), by Gerard, Gordon and others. 1957. 12p.
Order from LC mi$2.40 ph$3.30 PB 136404

Applied Physics Lab., Johns Hopkins Univ., Silver Spring, Md.
TENSILE PROPERTIES OF ALCLAD 2024-T3 ALUMINUM AT ELEVATED TEMPERATURES FOR SHORT TIMES (Short-time elevated-temperature strength of Alclad 2024-T3 aluminum could not be determined by extrapolating existing high temperature data for 30-minute soak times and longer. A design which is based on high-temperature data for 30-minute soak times and which is subjected to a rapid temperature rise will be inadequate during the first ten minutes at temperatures around 400°F), by Weckesser. 1956. 60p.
Order from LC mi$3.60 ph$9.30 PB 136428

Polytechnic Inst. of Brooklyn, N.Y.
CREEP DEFORMATIONS OF RECTANGULAR FRAMES (Experiments are described in which rectangular frames of 5052-0 aluminum alloy were subjected to loads at 500°F. The displacement velocities were measured and compared to the results of theoretical analysis. The effects of the rigid end fittings, of the beam-column action, and of simultaneous elastic and steady creep deformations were taken into account while primary creep was disregarded), by French, Patel and Hoff. 1957. 32p.
Order from LC mi$3.00 ph$6.00 PB 137175

Raytheon Mfg. Co., Waltham, Mass.
RESEARCH STUDIES AND INVESTIGATIONS OF THE SOLID STATE CHEMISTRY OF FERRITES (Phase equilibria in the system Fe-Ni-O have been investigated in the vicinity of $NiFe_2O_4$ up to a temperature of 1300°C), by Paladino. Quart. prog. rept. no. 2 1958. 20p.
Order from LC mi$2.40 ph$4.80 PB 137195

Research Inst., Temple Univ., Philadelphia, Pa.
HIGH TEMPERATURE PROJECT (Reaction between aluminum and oxygen; magnesium pressure runs; centrifugal runs with aluminum; combustion of zirconium and silicon in oxygen at atmospheric pressure; combustion of aluminum in fluorine; the boiling of silver in an aluminum reactor; and the thermodynamics of the oxidation of aluminum at high temperatures), by Grosse. Prog. rept. no. 3 1950. 94p.
Order from LC mi$5.40 ph$15.30 PB 137762

Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
SUPPLYING OF CAST TEST BARS FOR HIGH TEMPERATURE LEAN ALLOY STUDY (An investigation of the high-temperature behavior of modified chromium-nickel stainless steels in cast form has been conducted. A base analysis corresponding to a 17 Cr- 12 Ni- 2.5 Mo- 0.25 C stainless steel was modified by small additions of titanium, boron, and tungsten), by Salvaggi. Final rept. 1957. 20p.
Order from LC mi$2.40 ph$3.30 PB 137940

Naval Engineering Experiment Station, Annapolis
TESTING OF VARIOUS MATERIALS IN HIGH TEMPERATURE WATERS (includes metals - corrosion), by Lancaster. 1953. 22p.
Order from LC mi$2.70 ph$4.80 PB 138002

Smith, A.O., Corp., Milwaukee, Wis.
HIGH TEMPERATURE COATING RESEARCH (includes beryllium carbides - coatings), by Blanchard. 1948. 10p.
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HIGH TEMPERATURE COATING RESEARCH (includes beryllium carbides - coatings), by Blanchard. 1948. 11p.
Order from LC mi$2.40 ph$3.30 PB 138324

Nepa Div., Fairchild Engine & Airplane Corp., Oak Ridge, Tenn.
THE EFFECT OF MOLTEN BISMUTH ON INSULATING MATERIALS (Samples of twenty-six Johns-Manville insulating materials, which included cements, bonded fibrous blocks and fire bricks, were tested for possible reaction with molten bismuth. The tests consisted essentially of pouring molten bismuth at 1832°F (1000°C) over insulation maintained both at room temperature and at 1832°F (1000°C), by Fleshman and Collins. 1950. 16p.
Order from LC mi$2.40 ph$3.30 PB 138453

Cornell Univ., Ithaca, N.Y.
OXIDATION OF MAGNESIUM SINGLE CRYSTALS AND EVAPORATED FILMS (Apparatus and techniques were developed for measuring the oxidation of magnesium single crystals at high temperatures, and evaporated magnesium films at room temperature, with a sensitive microbalance capable of operating in an ultra-high vacuum. Single crystals were oxidized at an oxygen pressure of 2.5 mm Hg and temperatures of 400 and 440°C), by Addiss. Tech. rept. no. 1 1958. 95p.
Order from LC mi$5.40 ph$15.30 PB 138822

Istituto Elettrotecnico Nazionale "Galileo Gerraris" (Italy)
MAGNETIC RELAXATION AT HIGH TEMPERATURE DUE TO GRAIN BOUNDARY SLIP AND TO DISLOCATIONS (Internal mechanical friction and magnetic relaxation as a function of temperature on specimens of iron of different origin. Experiments on polycrystals and on very large crystals from 100° to 600°C), by Biorci, Ferro and Montalenti. Tech. note no. 1a 1958. 52p.
Order from LC mi$3.60 ph$9.30 PB 138878

Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
A STUDY OF THE TENSILE AND CREEP-RUPTURE PROPERTIES OF FIFTEEN HEATS OF C-110M TITANIUM ALLOY SHEET (A correlation exists between the room temperature strength properties and the yield and ultimate strengths at 500 and 700°F. However, the creep and rupture properties appear to be independent of the short time tensile strength results even at 700°F, which was the temperature used for creep testing), by Gillig and Guarnieri. 1956. 71p.
Order from LC mi$4.50 ph$12.30 PB 138990

Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
DEVELOPMENT OF LEAN-ALLOY CHROMIUM-NICKEL STAINLESS STEELS FOR HIGH TEMPERATURE USE (The austenitic chromium-nickel stainless steels, of the "18-8" variety with and without molybdenum, were used as base analyses to which were made additions of titanium, boron, vanadium, zirconium, nitrogen, and carbon. Evaluation of the 100-hour rupture life was made at 1500°F), by Salvaggi and Guarnieri. Summary rept. 1953. 62p.
Order from LC mi$3.90 ph$10.80 PB 139049

Ohio State Univ. Research Foundation, Columbus, O.
PROTECTION OF NIOBIUM AGAINST OXIDATION AT ELEVATED TEMPERATURES (Determination of the physical properties of the niobates and the study of the niobium--titanium-chromium ternary system and the niobium--zirconium binary system with respect to oxidation behavior), by Spretnak and Speiser. Rept. no. 16 1958. 23p.
Order from LC mi$2.70 ph$4.80 PB 139163

American Electro Metal Div., Firth Sterling, Inc., Yonkers, N.Y.
CEMENTED METAL BORIDES (Work started with an attempt to improve the impact strength of the otherwise quite satisfactory high temperature material Borolite IV (Cr_2B + Cr/Mo alloy, essentially by purification) Final summary rept. 1958. 61p.
Order from LC mi$3.30 ph$10.80 PB 139415

Naval Engineering Experiment Station, Annapolis
CORROSION OF MATERIALS IN HIGH TEMPERATURE WATERS (Results are reported on laboratory experiments dealing with stress-corrosion cracking of austenitic stainless steels in boiler water environments), by Lancaster and Williams. 1954. 24p.
Order from LC mi$2.70 ph$4.80 PB 139923

National Research Corp., Cambridge
OXIDATION RESISTANT COATING FOR MOLYBDENUM (For imparting high-temperature oxidation resistance to sintered bodies produced from molybdenum powders, equipment was constructed to coat the surface of powder grains with oxidation-resistant materials. Samples produced to date have not shown appreciable oxidation resistance), by Raymond. Final rept. 19 1958. 21p.
Order from LC mi$2.70 ph$4.80 PB 140114

Carborundum Co. (Niagara Falls, N.Y.)
DEVELOPMENT OF ULTRA REFRACTORY MATERIALS (The system HfO_2-ThO_2MgO has been investigated for temperatures of apparent melting and phases present at 1600°C. The stabilization of ZrO and HfO_2 has been investigated using selected carbides, nitrides, borides, and sub-oxides; and it has been shown that a cubic phase of ZrO_2 and HfO_2 results. Refractory analogues of zircon have been prepared using HfO and ThO_2 to replace ZrO_2. Hafnium silicate has exhibited unusually good resistance to severe thermal shock), by Cline and Lewis. Final rept. 1957. 21p.
Order from LC mi$2.70 ph$4.80 PB 140177

Science & Technology Div., Library of Congress, Washington, D.C.
THERMAL PROPERTIES OF CERTAIN METALS (includes metals - bibliography), by Goodwin and Ayton. 1956. 256p.
Order from LC mi$11.10 ph$42.60 PB 140392

MIT., Cambridge
PERIODIC STATUS REPORT NO. 24 (Solute strengthening of nickel alloys at elevated temperatures; fine slip investigation in polycrystalline aluminum and aluminum alloys; resistivity changes during creep of aluminum alloys; and, ductility and creep-rupture properties of nickel), by Pelloux, Rubin and others. 1958. 8p.
Order from LC mi$1.80 ph$1.80 PB 140626

AF Inst. of Tech., Wright-Patterson AFB, Ohio
ALLOWABLE STRESSES IN AIRCRAFT AND MISSILE STRUCTURES AT ELEVATED TEMPERATURES (The particular allowable stresses considered in detail are the buckling, column, and crippling stresses of thin sheet metal structure. Procedures are given for comparing different materials under given loading and type of structure. For thin sheet metal structure in compression, not only the temperature and load must be considered but also the geometry of the cross-section), by Gatewood. 1956. 64p.
Order from LC mi$3.90 ph$10.80 PB 142041

Brown Univ. Div. of Engineering, Providence, R.I.
PHENOMENOLOGICAL THEORIES OF TIME EFFECTS IN METALS AT HIGH TEMPERATURES WITH SPECIAL REFERENCE TO PRIMARY CREEP, by Hoskin. Tech. rept. no. 7 1958. 31p.
Order from LC mi$3.00 ph$6.30 PB 142075

Brussells Free Univ. (Belgium)
VAPORIZATION OF COMPOUNDS AND ALLOYS AT HIGH TEMPERATURE (The vaporization of ZnS, CdS, HgS, CdSe, HgSe, CdTe, HgTe from 400 to 1175°K, of sulfur, selenium tellurium from 350 to 600°K, InAs, GaP, GaSb from 900 to 1250°K and of an iron-nickel alloy from 1400 to 1600°K have been investigated. Preliminary experiments on the evaporation of an alloy show that this method can give useful information on thermodynamic properties especially on activities of the components), by Goldfinger, Ackerman and Jeunehomme. Final tech. rept. 1959. 62p.
Order from LC mi$3.90 ph$10.80 PB 142100

Frankford Arsenal, Philadelphia, Pa.
IMPROVED SINTERED BRASS COMPACTS (Substantially higher properties were obtained with sintered 70-30 brass compacts when lithium stearate, rather than the conventional zinc stearate, was used as the lubricant. The best properties were obtained with a lithium stearate addition of .50 and .75 per cent, a compacting pressure of 50 tons/sq inch (tsi), and a sintering atmosphere of nitrogen at 1600° of 1625°F. Preliminary studies have shown that improvements in properties can also be attained with the use of lithium stearate on compacts of copper, other copper base alloys, and iron), by Zaleski and Powell. 1959. 25p.
Order from LC mi$2.70 ph$4.80 PB 142509

Watertown Arsenal Labs., Mass.
HOT HARDNESS AND TENSILE PROPERTIES OF STAINLESS STEEL TYPE 304, TITANIUM ALLOY Ti-150A, AND SAE 4140 STEEL AT 300° AND 600°F, by Wong and Gazza. 1959. 36p
Order from LC mi$3.00 ph$6.30 PB 142893

Imperial Coll., London (Gt. Brit.)
THERMODYNAMICS OF MOLTEN ALLOYS (Dilute solutions of sulphur in liquid tin and lead. Sn-Cu-S, Sn-Ag-S, Sn-Pb-S and Cu-Ag-S systems), by Cheng. Final rept. no. 8 1959. 74p.
Order from LC mi$4.50 ph$12.30 PB 142939

Northrop Aircraft, Inc., Hawthorne, Calif.
STABILITY OF BERYLLIUM OXIDE IN HYDROGEN AT ELEVATED TEMPERATURES, by Ohlinger. 1948. 17p.
Order from LC mi$2.40 ph$3.30 PB 143041

Rensselaer Polytechnic Inst., Troy, N.Y.
THERMOGRAVIMETRIC AND CORROSION STUDIES AND PHASE EQUILIBRIA FOR LITHIUM, SODIUM AND POTASSIUM CARBONATES (Results of thermogravimetric studies on lithium and potassium carbonate in vacuum and in an atmosphere of CO_2 up to 600°C are reported. Corrosion studies including tests on platinum, silver, gold, boron nitride and single crystals of magnesium oxide are described), by Lorenz and Janz. Tech. rept. 2 1958. 27p.
Order from LC mi$2.70 ph$4.80 PB 143220

NRL, Washington, D.C.
THE INFLUENCE OF TEMPERATURE ELEVATION ON THE PENETRATION OF MISSILES INTO COPPER TARGETS (One-eight-inch-diameter tungsten carbide spheres were fired into thick copper targets at room temperature and at 800°F at velocities from less than 1000 to 5000 ft/sec. It is shown that the depth of penetration, crater diameter, and volume of target material displaced increase as a consequence of the elevation of the temperature. The depth of penetration of the missile and the volume of target material displaced are essentially independent of cracking and breakup of the missile until extensive fracturing makes it impossible to ascertain from visual observation that the missile was probably spherical), by Ferguson and McKinney. Interim rept. 1959. 14p.
Order from LC mi$2.40 ph$3.30 PB 143406

Armour Research Foundation, Chicago, Ill.
MEASUREMENT OF THE HEAT CAPACITY AND DENSITY OF LIQUID COPPER (The density and specific heat of molten electrolytic tough-pitch copper meeting Federal Specification QQ-C-576 was determined for the temperature range 2000 to 4000°F), by Lang. 1957. 23p.
Order from LC mi$2.70 ph$4.80 PB 143647

Minerals Research Lab., U. of Calif., Berkeley
HIGH TEMPERATURE HEAT CONTENTS OF SOME BINARY IRON ALLOYS (Measurements of the heat capacity at elevated temperatures for ferrochromium, ferromanganese, ferrosilicon, and ferrocobalt alloys), by Kendall, Orr and Hultgren. Tech. note 2 1959. 16p.
Order from LC mi$2.40 ph$3.30 PB 143672

Research Inst., Temple U., Philadelphia, Pa.
HIGH TEMPERATURE PROJECT (The studies concerned with the operation of powdered metal-oxygen torches, have been extended to various other powdered metals and alloys as follows: Aluminum, Magnesium, Manganese, Silicon, Calcium Carbide, Silicon Carbide, Calcium-Silicon, Zirconium-Silicon and Aluminum-Silicon), by Grosse and Conway. Prog. rept. 6 1952. 16p.
Order from LC mi$2.40 ph$3.30 PB 143758

Selskapet for Industriell og Teknisk Forskning ved Norges Tekniske Hogskole (Norway)
DISTRIBUTION OF HEAT AROUND FINITE MOVING SOURCES (Calorimetric measurements have been made of the net heat transferred to the work-piece in welding with the argon-arc, metal-arc, and SIGMA processes. Exploratory measurements of liquid weld metal temperatures indicate temperatures in the order of 2000°C and 1500°C in the welding of steel and of aluminum, respectively) Final tech. rept. 1959. 59p.
Order from LC mi$3.60 ph$9.30 PB 143836

Naval Engineering Experiment Station, Annapolis
EVALUATION OF CORROSION RESISTANCE OF CHROMIUM BASE ALLOYS TO HIGH TEMPERATURE GASES FROM RESIDUAL FUELS (The corrosion resistance of several chromium alloys to high temperature gases was determined by burning residual type fuels in small atmospheric combustors and full-scale pressurized gas turbine type combustors. Tests show that the corrosion attack on these alloys, by combustion products of the residual fuels burned to produce temperatures of 1600° and 1700°F, was less than that suffered by the base line material, AISI 310 (25% Cr - 20% Ni) alloy), by Schab and Gessner. 1957. 42p.
Order from LC mi$3.30 ph$7.80 PB 143873

Metals Processing Lab., MIT., Cambridge
CHROMIUM COATINGS FROM LIQUID METAL SOLUTIONS (Three types of solid-liquid interface are found to form by continuous cooling of a saturated solution of chromium in tin below the liquidus temperature. It was found possible to produce circa 0.001 inch coatings of chromium which are soft, dense and relatively smooth. Such coatings are too thin to offer protection to molybdenum above about 900°C in air. The .001 inch chromium deposits offer some promise as a barrier substrate for spray coats), by Schwarzkopf, Weglein and Wulff. Tech. rept. 1958. 31p.
Order from LC mi$3.00 ph$6.30 PB 143984

Stockholm U. (Sweden)
STUDIES ON THE CRYSTAL CHEMISTRY OF TITANIUM, VANADIUM AND MOLYBDENUM OXIDES AT ELEVATED TEMPERATURES, by Magneli, Andersson and others. Final tech. rept. 1 1959. 142p.
Order from LC mi$7.20 ph$22.80 PB 144408

Utah U., Salt Lake City.
KINETICS OF OXIDATION OF METAL POWDERS (When spherical magnesium particles were oxidized below the ignition temperature in a range of 400-600°C, it was observed that internal oxidation amounted to a larger percentage than external scale formation. Density determinations were undertaken before and after oxidation of the particles in an effort to study the mechanism of internal oxidation), by Boehm and Flanders. Tech. rept. 3 1958. 75p.
Order from LC mi$4.50 ph$12.30 PB 144562

Watertown Arsenal Labs., Mass.
ELEVATED TEMPERATURE CHARACTERISTICS OF THREE AGE HARDENED AND INTERNALLY OXIDIZED TITANIUM-COPPER-CERIUM ALLOYS (The effects of solid solution strengthening by zirconium and tantalum on the precipitation hardening response of Ti-2.0Cu-0.4Ce were determined. Elevated temperature characteristics after aging and after internal oxidation were compared and it was found that the beneficial effects of each treatment are not additive. Internal oxidation was observed to improve the temperature stability of the base alloy), by Dhosi. Master's thesis. 1959. 57p.
Order from LC mi$3.60 ph$9.30 PB 144922

Hammond Metallurgical Lab., Yale U., New Haven, Conn.
THE MECHANISM OF INTERGRANULAR RUPTURE OF COPPER AND ALUMINUM AT HIGH TEMPERATURES (Void-crack formation in creep was studied by means of density measurements and metallography in single crystals, bicrystals and polycrystals of copper of varying purity and polycrystalline aluminum of commercial purity as a function of stress, temperature and time. The importance of void-crack formation in analyses of creep curves and in the mechanism of penetration of liquid metals into solid nickels is discussed), by Robertson and Boettner. Final rept. 1959. 120p.
Order from LC mi$6.00 ph$18.30 PB 145175

Research Inst., Temple U., Philadelphia, Pa.
HIGH TEMPERATURE PROJECT (Experimental work concerned with the combustion of powdered metals: (a) powdered metal feed devices; (b) torch design; (c) operating characteristics; (d) flame temperatures obtained; (e) melting and cutting ability), by Grosse and Conway. Prog. rept. 5 1952. 38p.
Order from LC mi$3.00 ph$6.30 PB 145093

Central Inst. for Industrial Research (Norway)
OXIDATION OF NIOBIUM (The oxidation of niobium was studied at pressures of 760 to 10^{-2} torr (mm Hg) and at temperatures from 150° to 1000°C by gravimetric and volumetric rate measurements, X-ray and electron diffraction, and electron microscopy), by Hurlen, Kjøllesdal and others. Tech. scientific note 1 1959. 126p.
Order from LC mi$6.30 ph$19.80 PB 145171

Research Inst., Temple U., Philadelphia, Pa.
AN EXPERIMENTAL DETERMINATION OF THE DENSITIES OF MOLTEN METAL FLUORIDES IN THE RANGE OF 1600° to 2500°K (Using a graphite crucible and a tungsten sinker, the liquid densities of the alkaline earths and two rare earth fluorides were determined by the loss in weight of an immersed sinker method. The liquid molar volumes of the alkaline earth fluorides exhibit a linear relationship when plotted against period in the Periodic Table), by Kirshenbaum and Cahill. Tec. note 9 1959. 51p.
Order from LC mi$3.60 ph$9.30 PB 145363

Princeton U., N.J.
METAL COMBUSTION PROCESSES (Some preliminary conclusions on burning characteristics of the light metallic elements are presented. These conclusions are based on fundamental physical considerations and not on experimental results), by Glassman. Tech. rept. 1959. 43p.
Order from LC mi$3.30 ph$7.80 PB 145531

Institute for the Study of Metals, U. of Chicago
DIFFUSION IN SOLIDS AND LIQUIDS AND THE PROPERTIES OF SUBSTANCES AT HIGH TEMPERATURES (1) POINT IMPERFECTIONS IN METALS BY CONDUCTIVITY AND DIFFUSION MEASUREMENTS (2) OPTICAL PROPERTIES OF METALS by Nachtrieb, Tomizuka and Schulz. Final rept. 1957. 188p.
Order from LC mi$8.40 ph$28.80 PB 145836

Cornell U., Ithaca, N.Y.
DIFFUSION AND DESORPTION OF METAL IMPURITIES IN PLATINUM (Activation energies for the volume diffusion of impurities in polycrystalline platinum samples have been obtained by studying the ions released at temperatures above 1000°C), by Bradley. Tech. rept. 13 1959. 18p.
Order from LC mi$2.40 ph$3.30 PB 145868

Stockholm U. (Sweden)
STUDIES ON THE CRYSTAL CHEMISTRY OF TITANIUM, VANADIUM AND ZIRCONIUM OXIDES AT ELEVATED TEMPERATURES, by Magneli, Andersson and others. Final Tech. rept. 1 1958. 99p.
Order from LC mi$5.40 ph$15.30 PB 145923

North American Aviation, Inc., Downey, Calif.
PROPERTIES OF RESISTANCE SPOTWELD 24S-T3 AND 75S-T6 ALUMINUM ALLOY SHEET AND 17-7PH STAINLESS STEEL SHEET AT DEPRESSED AND ELEVATED TEMPERATURES, by Pelochino and Bellah. 1954. 143p.
Order from LC mi$7.20 ph$22.80 PB 146559

Nepa Div., Fairchild Engine & Airplane Corp., Oak Ridge, Tenn.
THE SOLUBILITY OF METALS AND ALLOYS IN LEAD-BISMUTH EUTECTIC AT TEMPERATURES UP TO 2200°F (A survey of readily available high temperature alloys and metals was made with respect to their solubility in lead-bismuth eutectic. The temperature range of 900° to 2200°F, for times up to 100 hours was investigated. Selected stainless steels, special alloys, and refractory metals were tested by the agitated capsule method developed at NEPA. Evidence of selective solubility of nickel and manganese makes the high nickel alloys undersirable. A.I.S.I. Type 446 showed the least solubility among the alloys and molybdenum was the most resistant of the metals tested), by Collins and Stephan. 1951. 13p.
Order from LC mi$2.40 ph$3.30 PB 146224

Ohio State U. Research Foundation, Columbus
THERMAL FUNCTIONS AND HEATS OF FORMATION OF SOME OF THE MAJOR VAPOR SPECIES IN THE BORON-OXYGEN-HYDROGEN SYSTEM AT ELEVATED TEMPERATURES, by White, Walsh and others. Tech. rept. 4 1959. 25p.
Order from LC mi$2.70 ph$4.80 PB 147086

Naval Engineering Experiment Station, Annapolis
INVESTIGATION OF HIGH-TEMPERATURE NOTCH SENSITIVITY IN A LOW-CARBON CR-MO-V PIPING STEEL (Notched and smooth bar rupture data, at temperatures of 1000° and 1100°F and times up to several thousand hours, are presented for a low-carbon Cr-Mo-V steam piping steel. It was found that notch sensitivity was dependent on stress as well as rupture time and temperature), by Niederberger. 1959. 22p.
Order from LC mi$2.70 ph$4.80 PB 147483

Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
EVALUATION OF CAST ALLOYS FOR USE AT HIGH TEMPERATURES (Austenitic stainless steel compositions containing 17-20% chromium, 12-20% nickel, 2.5-5% molybdenum and 0.27-0.48% carbon were modified by additions of minor quantities of titanium, boron, columbium and tungsten and cast into test bars using the shell mold process. Several of these compositions displayed excellent high temperature strength properties, with 100-hour rupture stress values in the 24,000 psi range at 1500°F and 14,500 psi range at 1600°F being recorded), by Salvaggi. Final rept. 1958. 13p.
Order from LC mi$2.40 ph$3.30 PB 148242

Space Sciences Lab., General Electric Co., Philadelphia, Pa.
A METHOD FOR THE OBSERVATION OF THE INFRARED SPECTRUM AT HIGH TEMPERATURE VAPORS BY MATRIX ISOLATION. I. THE INFRARED SPECTRUM OF LITHIUM FLUORIDE, by Linevsky. 1960. 18p.
Order from LC mi$2.40 ph$3.30 PB 148763

Naval Radiological Defense Lab., San Francisco
A RADIOMETRIC METHOD FOR DETERMINING SPECIFIC HEAT AT ELEVATED TEMPERATURES (The validity of radiometric method for the measurement of specific heat of metals as a function of temperature at elevated temperatures is investigated), by Butler and Inn. 1958. 27p.
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Wayne State U., Detroit, Mich.
PREPARATION OF LARGE AREA SINGLE CRYSTAL CUPROUS OXIDE AND THE ELECTRICAL CONDUCTIVITY OF SINGLE CRYSTAL CUPROUS OXIDE AT HIGH TEMPERATURES, by Toth, Kilkson and Trivich. Tech. rept 2 1960. 97p.
Order from LC mi$5.40 ph$15.30 PB 149759

Battelle Memorial Inst., Columbus, Ohio
ELECTRODEPOSITION OF CHROMIUM ALLOYS AND STUDY OF ELEVATED-TEMPERATURE PROPERTIES OF CERTAIN ELECTRODEPOSITED METALS AND ALLOYS, by Woodbury, Schaer and others:
Tech. prog. rept. 4 (One of the objectives of the work in this report period was to continue the elevated-temperature oxidation studies of electrodeposited metals in liquid- and vapor-phase molybdenum trioxide. Another objective was to determine the effect of changing the composition of chromium-iron alloy on its coefficient of thermal expansion and permanent change in length after heat treatment. Another objective was to determine the expansion and contraction behavior of electrodeposited cobalt-tungsten alloy and of a specimen of stress-free nickel) 1955. 28p.
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Tech. prog. rept. 6 (One of the objectives of the work during this period was to determine whether alternate layers of nickel and chromium plate could be diffused at 100 or 1150 C to form a nickel-chromium alloy. A second objective was to confirm the superiority of stress-free nickel plate over stressed nickel plate as regards denseness after heat treatment. A third objective was to compare the hot hardness of chromium with chromium-iron alloy plates) 1955. 21p.
Order from LC mi$2.70 ph$4.80 PB 148737
Tech. prog. rept. 7 1955. 38p.
Order from LC mi$3.00 ph$6.30 PB 148738

Lockheed Aircraft Corp., Sunnyvale, Calif.
GENERAL RESEARCH IN MATERIALS AND PROPULSION, JANUARY 1959-JANUARY 1960. VOLUME II. METALLURGY AND CHEMISTRY (Electronic structure of beryllium (LMSD-288003); electrical resistivity of beryllium; plastic deformation in beryllium; beryllium analyzed for trace impurities by gamma-ray activation; high-temperature corrosion of beryllium in air; stress corrosion cracking of beryllium (LMSD-49735); grain refinement in beryllium by alloying; specific heats of beryllium and an alloy at room and elevated temperatures (LMSD-2702); studies of the gas carburization of niobium; and study of halide-containing oxide films on columbium) 1960. 275p.
Order from LC mi$11.10 ph$42.60 PB 150613-2

Rensselaer Polytechnic Inst., Troy, N.Y.
FUSED SALT CHEMISTRY (Molten salts from systems which are liquid at temperatures up to 3000°C at atmospheric pressure), by Janz. Tech. note 11 1959. 31p.
Order from LC mi$3.00 ph$6.30 PB 143924

Defense Metals Information Center, Battelle Memorial Inst., Columbus, Ohio
COATINGS FOR PROTECTING MOLYBDENUM FROM OXIDATION AT ELEVATED TEMPERATURE (Protective coatings are considered from two points of view - the coating system and the method of application of the coating to the molybdenum base. Systems discussed include chromium, silicon, nickel, precious metals, ceramic materials, and refractory oxides. Methods of application are electroplating, flame spraying, vapor deposition, cladding, enameling, and liquid-phase diffusion), by Bartlett, Ogden and Jaffee. 1959. 45p.
Order from OTS at $1.25 PB 151064

TITANIUM ALLOYS FOR HIGH-TEMPERATURE USE STRENGTHENED BY FIBERS OR DISPERSED PARTICLES (Available data are reviewed on heterogeneous structures of titanium in which the titanium matrix is reinforced by a dispersion of metal fibers or particles), by Holladay. 1959. 79p.
Order from OTS at $2.00 PB 151073

Defense Metals Information Center, Battelle Memorial Inst., Columbus, Ohio
CURRENT TESTS FOR EVALUATING FRACTURE TOUGHNESS OF SHEET METALS AT HIGH STRENGTH LEVELS (In attempting to overcome the brittle fracture problem in solid propellant rocket cases, a number of investigators have developed special tests to measure the fracture toughness of high-strength sheet metals), by Campbell and Achbach. 1960. 71p.
Order from OTS at $2.00 PB 151081

TANTALUM AND TANTALUM ALLOYS, by Schmidt. 1960. 334p
Order from OTS at $5.00 PB 151091

PHYSICAL AND MECHANICAL PROPERTIES OF COLUMBIUM AND COLUMBIUM-BASE ALLOYS (The current state of knowledge of the physical and mechanical properties of columbium and its alloy is reviewed. Columbium has good potential as an alloying base because of its low neutron-capture cross section (reactor applications) and high melting point, and related potential high-temperature strength (air- and space vehicles structural applications), by Bartlett and Houck. 1960. 66p.
Order from OTS at $1.75 PB 151082

Boeing Airplane Co., Seattle, Wash.
BRAZING HONEYCOMB CORE TITANIUM PANELS (Final report on the development of fabrication techniques for brazing titanium skins to honeycomb cores of both 17-7PH steel and titanium to form sandwich panels capable of operating in temperature environments up to 700°F. Twelve silverbase alloys were investigated for joining skins of 6Al-4V titanium alloy to 17-7PH core and to unalloyed titanium core. The alloy selected for process development work was a 97% silver - 3% lithium. Thirty 3" x 8" all-titanium panels were brazed and destructively tested in beam-shear and in short-column at temperatures of ambient, 500°F, and 700°F), by Noritake and Grow. Final rept. 1957. 72p.
Order from OTS $2.00 PB 151116

Martin Co., Baltimore, Md.
DEVELOPMENT OF BRAZED SANDWICH CONSTRUCTION MATERIALS FOR HIGH TEMPERATURE APPLICATIONS, by Burrows and Ragland. 1958. 115p.
Order from OTS at $2.50 PB 151272

Southwest Research Inst. (San Antonio, Tex.)
DETERMINATION OF MATERIALS DESIGN CRITERIA FOR 6Al-4V TITANIUM ALLOY AT ROOM AND ELEVATED TEMPERATURES (In order to establish design criteria on the 6Al-4V titanium alloy, tensile, compressive, bearing and shear properties have been determined on both bar and sheet material at temperatures from 75 to 1000°F), by Childs and Lemcoe. 1958. 257p.
Order from OTS at $4.00 PB 151274

Defense Metals Information Center, Battelle Memorial Inst., Columbus, Ohio
COMPILATION OF AVAILABLE INFORMATION ON THE Ti-7Al-(3-4)Mo ALLOY (Ti-7Al-(3-4)Mo is a bar and forging alloy designed for use in elevated-temperature applications and as high-strength forgings. Recommended practices in production and fabrication are included, and the information presented may be considered as typical of current practice), by Douglass and Holden. 1958. 99p.
Order from OTS at $2.25 PB 151322

Metcut Research Associates, Cincinnati, Ohio
HIGH TEMPERATURE COATINGS FOR CHROMIUM HOT WORK TOOL STEELS, by Norris. 1958. 84p.
Order from OTS at $2.25 PB 151423

American Electro Metal Div., Firth Sterling, Inc., Yonkers, N.Y.
NEW HIGH TEMPERATURE INTERMETALLIC MATERIALS (in the search for new high temperature materials, an investigation of new intermetallic compounds was conducted, including five ternary systems and a number of binary rare earth intermetallic compounds. Addition of Mo to Cr_2Ti improved its strength behavior. Addition of Cr, Ti, or Nb to NiAl did not significantly improve its mechanical properties. Addition of Zr improved its mechanical properties but not its oxidation resistance. X-ray identification and in some cases physical properties of the rare earth aluminides and silicides are presented), by Grinthal. 1958. 80p.
Order from OTS at $2.25 PB 151353

Crucible Steel Co. of America, Pittsburgh, Pa.
A STUDY OF THE METALLURGICAL PROPERTIES THAT ARE NECESSARY FOR SATISFACTORY BEARING PERFORMANCE AND THE DEVELOPMENT OF IMPROVED BEARING ALLOYS FOR SERVICE UP TO 1000 F (to develop a bearing steel for operating temperatures up to 1000 F, fifty-one experimental compositions were studied), by Philip, Steven and Nehrenberg. 1958. 56p.
Order from OTS at $1.75 PB 151415

NOL, White Oak, Md.
EFFECTS OF EXTREMELY HIGH TEMPERATURES ON MAGNETIC PROPERTIES OF CORE MATERIALS (magnetic properties of the following ferromagnetic alloys: Orthonol, 4-79 Mo Permalloy, 4750 AEM, L and Z Silectron, Transformer A, Audio Transformer A, 11.7 Alfenol, 15.5 Alfenol, 3% Mo Thermenol, 7-70 Perminvar, and Supermendur, for the temperature range of 24°C to 800°C), by Pasnak and Ludsten. 1958. 60p.
Order from OTS at $1.75 PB 151432

Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
INVESTIGATION OF THE COMPRESSIVE, BEARING AND SHEAR CREEP-RUPTURE PROPERTIES OF AIRCRAFT STRUCTURAL METALS AND JOINTS AT ELEVATED TEMPERATURES, by Yerkovich. 1958. 96p.
Order from OTS at $2.50 PB 151445

New York U. Coll. of Engineering, N.Y.
DEVELOPMENT OF ACTIVE-EUTECTOID BASE ALLOYS (this alloy development program is a study of the effect of stepwise additions of Al and/or Sn and/or Zr to binary Ti-2Cu, Ti-4Cu, and Ti-6Cu alloys; several alloys showed excellent tensile properties particularly in the range 1000 to 1200°F. A Ti-6Cu-7Al-6Zr alloy was outstanding, showing a tensile strength of 108,900 psi at 1200°F. These alloys show promise of utility in the 1000 to 1200°F range. Instability apparently associated with the Ti-Al phases was encountered), by Bunshah and Margolin. 1958. 51p.
Order from OTS at $1.50 PB 151518

Crucible Steel Co. of America, Pittsburgh, Pa.
INVESTIGATION OF Fe-Mn-Cr-N-C SYSTEM FOR HEAT RESISTANCE AND OXIDATION RESISTANCE BETWEEN 1200 F AND 2000 F, by Tarwater and Dulis. 1958. 115p.
Order from OTS at $2.50 PB 151558

Southern Research Inst., Birmingham, Ala.
DETERMINATION OF TENSILE, COMPRESSIVE, BEARING AND SHEAR PROPERTIES OF SHEET STEELS AT ELEVATED TEMPERATURES, by Kattus, Preston and Lessley. 1958. 299p
Order from OTS at $4.00 PB 151592

Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
INVESTIGATION OF THE COMPRESSIVE, BEARING, AND SHEAR CREEP-RUPTURE PROPERTIES OF AIRCRAFT STRUCTURAL METALS AND JOINTS AT ELEVATED TEMPERATURES (This report summarizes in tabular and chart form the high temperature properties of PH15-7 Mo stainless steel and 6Al-4V titanium alloy in tension, compression, bearing, and shear. In addition, correlations of the tensile creep-rupture properties with corresponding compression, bearing, and shear creep-rupture properties are presented), by Yerkovich. 1958. 97p.
Order from OTS at $2.00 PB 151561

Armour Research Foundation, Chicago, Ill.
MEASUREMENTS OF THERMAL PROPERTIES (The objective of this program was the measurement of the high temperature thermal properties of materials. The materials investigated were Stainless Steel type 316, Stainless Steel type 347, Hastelloy R-235, Aluminum Oxide, Niobium, Lithium Hydride and Synthetic Sapphire. The thermal conductivity, specific heat, and linear thermal expansion were measured from 100°F to 3000°F, or to the melting point of the material, whichever was lower. Both the experimental measurements and the results of the conversion of these measurements to the desired physical properties are given), by Fieldhouse, Lang, and Hedge. 1958. 108p.
Order from OTS at $2.50 PB 151583

Aeronautical Research Lab., WADC., Wright-Patterson AFB, Ohio.
ZIRCONIA: ITS CRYSTALLOGRAPHIC POLYMORPHY AND HIGH TEMPERATURE POTENTIALS (Zirconia (ZrO_2), with a melting point of 2680°C (4850°F) is one of the more promising materials for high temperature applications. Its usefulness is significantly dependent on controlling its crystallographic transformations. Experiments conducted in the Aeronautical Research Laboratory have clarified some of the controversial data presented in the literature. Future potentials for ZrO -base materials for high temperature structural and corrosion-resistance applications are described), by Weber and Schwartz. 1958. 26p.
Order from OTS at 75 cents PB 151665

Ill. U. Engineering Experiment Station, Urbana
THE EFFECTS OF INELASTIC ACTION ON THE RESISTANCE TO VARIOUS TYPES OF LOADS OF DUCTILE MEMBERS MADE FROM VARIOUS CLASSES OF METALS. Part 8. ECCENTRICALLY-LOADED TENSION MEMBERS MADE OF TWO STAINLESS STEELS TESTED AT ELEVATED TEMPERATURES (In the experimental investigation, tests were made on eccentrically-loaded rectangular-section members made of type 304 stainless steel at a test temperature of 1000°F and 17-7 PH stainless steel at test temperatures of 1000°F and 1200°F. Some of the 17-7PH stainless steel specimens were given a precipitation hardening treatment and some were tested in the untreated condition), by Sidebottom, Clark and Dharmarajan. 1958. 61p.
Order from OTS at $1.75 PB 151673

THE EFFECTS OF INELASTIC ACTION ON THE RESISTANCE TO VARIOUS TYPES OF LOADS OF DUCTILE MEMBERS MADE FROM VARIOUS CLASSES OF METALS. Part 9. T-SECTION ECCENTRICALLY-LOADED TENSION MEMBERS MADE OF TYPE 304 STAINLESS STEEL AND TESTED AT 1000°F, by Sidebottom and Dharmarajan. 1958. 18p.
Order from OTS at 50 cents PB 151674

Science and Technology Div., Library of Congress
Washington, D.C.
THERMAL PROPERTIES OF CERTAIN METALS. Part II. IRON BERYLLIUM, IRIDIUM, PALLADIUM, PLATINUM, AND TUNGSTEN (The bibliography on the thermal properties of certain metals consists of references, with abstracts, to pertinent open literature published from 1920 to 1957, and to unclassified reports issued from about 1944 to 1957. These references were obtained by a compressive search of the sources listed in the Introduction. The material included in the bibliography pertains to various thermal properties, namely, heat capacity, thermal conductivity, emissivity, thermal diffusivity, and thermal expansion of iron (pure), beryllium, iridium, rhodium, palladium, platinum, and tungsten), by Goodwin and Ayton. 1958. 321p.
Order from OTS at $5.00 PB 151679

Horizons, Inc., Cleveland, Ohio.
RESEARCH FOR COATINGS FOR PROTECTION OF NIOBIUM AGAINST OXIDATION AT ELEVATED TEMPERATURES (In order to profit from desirable high temperature properties of Nb, oxidation resistant alloys or coatings must be developed. Nb alloys have been prepared offering up to a 20 fold reduction in oxidation at 2000°F compared to pure Nb. Flame sprayed and electrodeposited coatings were developed giving more complete protection for 4-6 hrs. up to 2500°F. Preparation of alloys and coatings together with test procedures and results are described for both phases), by Hirakis. 1959. 74p.
Order from OTS at $2.00 PB 151684

Materials Lab., WADC., Wright-Patterson AFB, Ohio
MECHANICAL PROPERTIES OF 17-7 PH AND PH 15-7 MO. STAINLESS STEEL, by Brisbane. 1959. 38p.
Order from OTS at $1.00 PB 151703

NBS, Washington, D.C.
OXIDATION OF EXPERIMENTAL ALLOYS (A study was made of the oxidation resistance of five newly developed high-temperature alloys), by Richmond and Thornton. 1959. 19p.
Order from OTS at 50 cents PB 151741

Watertown Arsenal Lab., Mass.
APPLICATION OF INDUCTION HEATING TO SHORT-TIME ELEVATED TEMPERATURE TENSILE TESTING (Tensile test data were obtained at 600°, 800°, and 1000°F on 120 plain and welded titanium alloy specimens. Typical results obtained are given and the limitations and possibilities of the technique discussed), by Levitt and Martin. 1959. 18p.
Order from OTS at 50 cents PB 151848

MIT., Cambridge, Mass.
FINE PARTICLE STRENGTHENING FOR HIGH TEMPERATURE USE (The promise offered by internal oxidation of dilute solutions in which the solute element forms a stable refractory oxide is illustrated by recent work with nickel-aluminum solid solutions, with testing of the alloys at 816°C (1500°F); also includes powder alloys - mechanical properties and sintering), by Schwarzkopf and Grant. 1958. 18p.
Order from OTS at 50 cents PB 151863

Ill. U., Urbana
THE EFFECTS OF INELASTIC ACTION ON THE RESISTANCE TO VARIOUS TYPES OF LOADS OF DUCTILE MEMBERS MADE FROM VARIOUS CLASSES OF METALS, by Sidebottom and Dharmarajan. 1959. 32p.
Order from OTS at $1.00 PB 151894

Office of Ordnance Research, Durham, N.C.
CONFERENCE ON RESEARCH IN PROGRESS ON TUNGSTEN HELD 20-21 MAY 1959 AT DUKE UNIVERSITY (includes tungsten-bibliography), 1959. 102p.
Order from OTS at $2.50 PB 161013

Battelle Memorial Inst., Columbus, Ohio
THE EFFECTS OF SOLUTE ELEMENTS ON THE STRENGTH PROPERTIES OF IRON- AND COBALT-BASE ALLOYS, by Wolff, Underwood and others. 1959. 71p.
Order from OTS at $2.00 PB 161043

Defense Metals Information Center, Battelle Memorial Inst., Columbus, Ohio
ELEVATED-TEMPERATURE MECHANICAL PROPERTIES AND OXIDATION RESISTANCE OF COLUMBIUM AND ITS ALLOYS, by Schwartzberg and Klopp. 1959. 12p.
Order from OTS at 50 cents PB 161159

PHYSICAL AND MECHANICAL PROPERTIES OF MOLYBDENUM AND THE Mo-0.5Ti ALLOY (Some physical properties of molybdenum and the Mo-0.5Ti alloy of interest in the elevated temperature applications of these materials are briefly summarized. Mechanical properties, including tensile, impact and fatigue data and creep and stress-rupture properties over a wide range of temperatures are also presented), by Douglass. 1959. 23p.
Order from OTS at 50 cents PB 161164

PHYSICAL AND MECHANICAL PROPERTIES OF TANTALUM, by Ogden. 1959. 19p.
Order from OTS at 50 cents PB 161182

FABRICATION OF PURE COLUMBIUM (The fabrication of pure columbium is readily carried out cold with conventional tools. Precautions must be taken, when extreme-pressure processes are used, to prevent sticking by the use of very smooth die finishes and proper lubricants. Since the metal is rapidly contaminated by all common gases at elevated temperatures, welding operations must be performed in an atmosphere of helium or purified argon, and annealing operations in a high vacuum. Solid-solution alloys may be handled, in general, like pure columbium), by Klopp and Hodge. 1959. 9p.
Order from OTS at 50 cents PB 161184

HEAT CAPACITY OF BERYLLIUM (This memorandum collects the data available to the Defense Metals Information Center on the heat capacity of beryllium. Heat capacity as a function of temperature and the effect of impurities on the heat capacity are discussed), by Holladay. 1959. 11p.
Order from OTS at 50 cents PB 161186

THE WELDING OF WRIGHT AGE-HARDENABLE NICKEL-BASE ALLOYS FOR SERVICE AT ELEVATED TEMPERATURES (The purpose of this memorandum is to summarize information on welding wrought age-hardenable nickel-base alloys. The report will cover the fusion and resistance welding of some of the more familiar alloys that comprise the age-hardenable nickel-base materials), by Lepowski and Monroe. 1959. 21p.
Order from OTS at 50 cents PB 161188

RECENT DEVELOPMENTS IN TITANIUM BRAZING, by Lewis and Faulkner. 1960. 8p.
Order from OTS at 50 cents PB 161195

Defense Metals Information Center, Battelle Memorial Inst., Columbus, Ohio
BRAZING FOR HIGH-TEMPERATURE SERVICE (The purpose of this memorandum is to summarize the extent of advancement in the field of brazing for service temperatures in excess of 600 F. In recent years, the need for parts fabricated from high-temperature, high-strength corrosion-resistant alloys has imposed a demand for brazing filler metals which are compatible with these base metals and their usage), by Haskins and Evans. 1960. 15p.
Order from OTS at 50 cents PB 161198

REVIEW OF PROBLEMS IN USING FLAT-ROLLED MATERIALS IN AIR- AND SPACE-WEAPON SYSTEMS (It has been estimated that, within 5 years, materials will be expected to operate at 1200 F for reasonably long times and at or above 2000 F for a few minutes. Within 10 years, operational temperatures are expected to reach 2500 F for a few minutes and 4000 F for a life of a few seconds. Therefore, this review deals mainly with problems in producing and using sheet materials intended for service at high temperatures), by Boulger. 1960. 23p.
Order from OTS at 50 cents PB 161202

PHYSICAL AND MECHANICAL PROPERTIES OF THE COBALT-CHROMIUM-TUNGSTEN ALLOY WI-52 (WI-52 was designed for gas-turbine components requiring high-strength properties in the 1000 to 2000 F temperature range. It has been used primarily as a first-stage turbine vane, supplanting the older X-40 (HS 31) alloy. Above 1800 F it may be useful in applications requiring resistance to thermal shock, fatigue, and oxidation, but with lower strength requirements. It is available only in the form of castings), by Morral and Wagner. 1960. 20p.
Order from OTS at 50 cents PB 161216

Case Inst. of Tech., Cleveland, Ohio
RESEARCH ON STRAIN AGING EFFECTS IN TITANIUM, by Gurev and Baldwin. 1959. 70p.
Order from OTS at $1.75 PB 161304

Armour Research Foundation, Chicago, Ill.
METHODS OF PURIFICATION OF METALS AND INTERMETALLIC COMPOUNDS (SiC, ThO_2, and ZrO_2 were studied to learn how impurities move in thermal gradients in potential materials for high temperature thermoelectric, thermionic, or photovoltaic generators. The electrical resistivity, thermal conductivity, and thermoelectric power of ThO_2 and ZrO_2 were studied at high temperatures), by Susman. 1959. 86p.
Order from OTS at $2.25 PB 161415

Battelle Memorial Inst., Columbus, Ohio
THERMAL PROPERTIES OF MATERIALS AT ELEVATED TEMPERATURES (Apparatus was designed and assembled for making linear-thermal-expansion, specific-heat, and thermal-conductivity measurements to 5000 F or above on metals and ceramic-type materials), by Deem, Wood and Lucks. 1959. 22p.
Order from OTS at 75 cents PB 161478

Materials Lab., WADC, Wright-Patterson AFB, Ohio
AN INVESTIGATION OF THE RELATIONSHIP OF HOT-HARDNESS TO THE ELEVATED TEMPERATURE EXTRUSION BEHAVIOR OF SELECTED ARC-CAST MOLYBDENUM BASE ALLOYS, by Giancola. 1960. 133p.
Order from OTS at $2.75 PB 161669

Research Inst., Temple U., Philadelphia, Pa.
STUDY OF ULTRA HIGH TEMPERATURES (Covers such topics as: The production of high temperature flames; Systems of carbon, nitrogen and oxygen; The cyanogen-oxygen flame as a high temperature tool; Systems using fluorine; The fastest burning flame - the premixed hydrogen-fluorine flame; Systems using ozone; Imaging of the oxygen-aluminum flame and its use as an artificial sun furnace; Two phase reactions at high temperatures; Combustion of beryllium in oxygen; The temperature of the zirconium-oxygen flame; An experimental determination of the densities of molten metal fluorides in the range of 1600^0 to 2500^0K; Preparation of carbon-phosphorus compounds), by Grosse. 1959. 31p.
Order from OTS at $1.00 PB 161460

Battelle Memorial Inst., Columbus, Ohio
THERMAL PROPERTIES OF MATERIALS AT ELEVATED TEMPERATURES (Apparatus was designed and assembled for making linear-thermal-expansion, specific-heat, and thermal-conductivity measurements to 5000 F or above on metals and ceramic-type materials), by Deem, Wood and Lucks. 1959. 22p.
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New York U., N.Y.
INVESTIGATION OF CREEP BUCKLING OF COLUMNS AND PLATES. Part I. ELEVATED TEMPERATURE PROPERTIES OF THE TEST MATERIAL Ti-7Al-4Mo TITANIUM ALLOY, by Papirno and Gerard. 1959. 34p.
Order from OTS at $1.00 PB 161488

Climax Molybdenum Co. of Michigan, Detroit
DEVELOPMENT OF HIGH STRENGTHS AND HIGH RECRYSTALLIZATION TEMPERATURES IN MOLYBDENUM-BASE ALLOYS (In addition to the ternary alloy, promising elevated temperature properties were exhibited by binary alloys containing 2.00% titanium, (0.14% carbon), and 0.3 and 0.5% zirconium (0.022 carbon), by Semchyshen, McArdle and Barr. 1959. 128p.
Order from OTS at $2.75 PB 161542

SKF Industries, Inc., Philadelphia, Pa.
ENDURANCE TESTS OF ROLLING CONTACT BEARINGS OF CONVENTIONAL AND HIGH TEMPERATURE STEELS UNDER CONDITIONS SIMULATING AIRCRAFT GAS TURBINE APPLICATIONS, by Walp, Remorenko and Porter. 1959. 87p.
Order from OTS at $2.25 PB 161672

Cincinnati Milling Machine Co., Ohio
HIGH TEMPERATURE MACHINING METHODS. PHASE I. EVALUATION OF ELEVATED TEMPERATURE MACHINING METHODS, by Pentland, Mehl and Wennberg. 1960. 187p.
Order from OTS at $3.00 PB 161680

Brush Beryllium Co., Cleveland, Ohio
AN INVESTIGATION OF INTERMETALLIC COMPOUNDS FOR VERY HIGH TEMPERATURE APPLICATIONS (Intermetallic compounds from thirty-five binary metallic systems were prepared, fabricated into oxidation-test specimens, and tested for oxidation resistance in dry air at 2300^0F. Only high-melting (above 2550^0F) compounds were studied. These included aluminides, beryllides, silicides, germanides, and zirconides, as well as numerous miscellaneous compounds. A literature survey of intermetallic compounds is included.), by Paine, Stonehouse and Beaver. 1960. 247p.
Order from OTS at $3.50 PB 161683

NRL, Washington, D.C.
HIGH TEMPERATURE OXIDATION OF IRON-CHROMIUM BINARY ALLOYS IN WATER VAPOR. Part 1: A PRELIMINARY STUDY OF THE MECHANISM OF OXIDATION OF IRON-CHROMIUM BINARY ALLOYS IN WATER VAPOR, by Fujii and Meussner. Final rept. 1960. 27p.
Order from OTS at 75 cents PB 161696

Dayton U. Research Inst., Ohio
FURTHER INVESTIGATION OF THE EFFECTS OF MOLTEN BORON OXIDE ON HIGH TEMPERATURE MATERIALS (The corrosion resistance of a group of high temperature materials, typical of those available for use in aircraft power plants, was evaluated in a boron oxide environment. Exposure consisted of cyclic immersion in B_2O_3 at temperatures of 1750°-2200°F. for periods up to 145 hours in an air atmosphere), by Rosenbery. 1960. 102p.
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THE REMANENCE OF ALNICO V AND VI MAGNETS BETWEEN ROOM TEMPERATURE AND 550°C, by Tenzer. 1960. 21p.
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Bell Aircraft Corp., Buffalo, N.Y.
MECHANICAL PROPERTIES OF SELECTED ALLOYS AT ELEVATED TEMPERATURES, Part 1 (The materials studied and the temperature range of testing were: AM 355 - R.T. - 1000°F, PH 15-7M° - R.T. - 1000°F, HK31-H24 - R.T. - 600°F, A 286 - R.T. - 1200°F, Udimet 500 - R.T. - 1700°F and Inconel X - R.T. - 1500°F), by Pearl, Kappelt and King. 1960. 268p.
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Denver Research Inst., Colo.
SURVEY OF THE BROACHING PROCESS (An extensive survey of the broaching process was performed to determine current status, problem areas, current efforts at resolution of problems, and needed developments. In addition to a survey of broaching literature, fifty-one organizations were contacted for information. Difficult-to-machine high temperature alloys have created broaching problems of which short tool life is the most serious. Current efforts toward resolution are limited in extent. Improved tool materials, broach design information, and comprehensive broach life data are needed), by Hanna and Eppinger. 1960. 126p.
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Armour Research Foundation, Chicago, Ill.
METHODS AND CONTROLS FOR PRODUCING CASTABLE DIES FOR FORGING STEEL AND TITANIUM ALLOYS (High performance aircraft forgings of high-strength steels, with long, thin sections, can now be produced with a minimum of costly and time consuming machining. Forging dies capable of operating at 1600°F can be cast with cavities which require no machining), Murphy, Nichols and Gouwens. Final tech. rept. 1959. 104p.
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DEVELOPMENT OF HIGH TEMPERATURE DIE MATERIALS (HOT DIE MATERIALS) (Precision, thin-walled, high-strength steel forgings for high performance aircraft and missiles can be quickly and economically forged in hot dies of Inconel 713-C using a potassium iodide-graphite lubricant-parting agent. The nickel-base casting alloy, (Inconel 713-C) proved superior to a cobalt-base alloy (HE 1049) and four other basic alloy families in oxidation resistance, and compressive deformation strength at temperatures as high as 1600°F), by Nichols, Graft and others. Final tech. rept. 1959. 133p.
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BERYLLIUM JOINING; RAD SPONSORED PROGRAM, by Cohen. 1960. 45p.
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BERYLLIUM JOINING; WADC SPONSORED PROGRAM (Joining of beryllium plates and rods by braze welding, fusion welding, and pressure welding was investigated, with the objective of developing improved methods for applications at both room and elevated temperatures), by Passmore. 1960. 127p.
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DETERMINATION OF THE MECHANICAL PROPERTIES OF AIRCRAFT-STRUCTURAL MATERIALS AT VERY HIGH TEMPERATURES AFTER RAPID HEATING (The short-time, elevated-temperature tensile properties were determined and are reported (1) for unalloyed beryllium at temperatures from ambient through 1500°F (2) for ten combinations of base materials (ETP copper, A-nickel, unalloyed molybdenum, and molded graphite) with protective coatings (chromium and nickel by electroplating; aluminum oxide, zirconium oxide, and zirconium silicate by flame spraying; silicon carbide and silicon carbide nitride by a diffusion reaction on the surface of graphite), and (3) for a typical high-temperature alloy with linear temperature gradients normal to the axis of loading), by Preston and Kattus. 1960. 81p.
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TRENDS IN THE DEVELOPMENT OF HIGH-TEMPERATURE METALLOGRAPHY, by Lozinskiy. 1960. 26p.
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STRESS CORROSION CRACKING OF AUSTENITIC STEELS AT ELEVATED TEMPERATURES AND PRESSURES, by Sidorov and Ryabchenko. 1958.
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EFFECT OF PLASTIC DEFORMATION ON HIGH-TEMPERATURE STRENGTH OF (NICKEL) ALLOY EI 437 (High-temperature properties of a creep-resisting, precipitation-hardening Ni-20% Cr-2 1/2% Ti alloy after prestraining and/or aging. Rupture strength at 700°C (1290F) as affected by surface prestraining in various ways. Effect of aging temperature and time. Temperature range in which the influence of grain refinement predominates and range in which the cohesive strength is impaired), by Kishkin, Klypin and Sulima. 1959.
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Another translation is available from OTS at 50 cents as 59-13154, JPRS(NY)-L-573, 16 Dec 58, 5p.
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DEFORMATION OF TECHNICAL IRON IN THERMAL-CYCLING (Study of effect of temperature fluctuations on the strength of metal parts during service at elevated temperatures. Experimental procedure; design and dimensions of specimens of technical iron. Circumstances leading to the formation of two necks on specimens tested; explanation of this phenomenon), by Lozinskiy and Simeonova. 1959. 1600 wds.
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EFFECT OF ALLOYING ON THE HARDENING AND SOFTENING OF HIGH-TEMPERATURE IRON-BASE ALLOYS (Effect of C, V, Al, Mo, W, and Cb (up to 3 at-% ea) on hardening and softening of an iron-base composition with 13% Cr, 8 Ni, and 8Mn. Procedure. Results: Recrystallization temperatures and structures...Advantages of the alloy with tungsten...(HB abstract), by Zhirnov. 1959. 1000 wds.
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A STUDY OF THE PRECIPITATION OF Fe_3O_4 IN THE SCALE PRODUCED ON IRON AT HIGH TEMPERATURES (The precise conditions of formation of Fe_3O_4 in iron oxide films has been studied by the microscopical examination of iron specimens heated at elevated temperatures. The formation of Fe_3O_4 inside films of ferrous oxide is due to the decomposition of FeO during cooling), by Paidassi. 1960.
Trans. of Rev(ue de) Met(allurgie) (France) 1955 (v. 52) no. 11, p. 869-886.
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EFFECT OF VARIOUS ADMIXTURES ON PROTECTION OF COPPER AGAINST OXIDATION AT HIGH TEMPERATURES (Aluminum, beryllium, and magnesium in amounts of 1 or 2 at.-% were the most effective alloying elements for reducing the rate of oxidation of copper in highly electro-conductive copper alloys at temperatures of 500 to 800°C. Other alloying elements tested were Zn, Sn, Cr, Ni, Cd, Zr, and Mn), by Zakharov and Kalinina. 1959. 11p.
Trans. of Issledovaniye Splavov Tsvetnykh Metallov (USSR) 1959, v. 1, p. 111-116.
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FATIGUE STRENGTH OF TUNGSTEN CARBIDE-COBALT ALLOYS (The fatigue limit was determined for alloys with cobalt contents of 4, 6, and 8% at room and high temperatures (1000°C); and correlated with cobalt content and the grain size of the tungsten carbide. The importance is confirmed of the initial plasticity as a measure of the resistance of the material to deformation on cyclic loading), by Kreymer, Sidorin and Tishchenkov. 1960. 6p.
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Another translation is available from HB $5.85 as HB-4508, Mar 59.
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Trans. of RILEM Bulletin (France) 1959, no. 4, p. 66-75.
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Trans. of Brennstoff-Warme-Kraft (West Germany) 1951, v. 3 (no. 5) p. 141-143.
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Argonne National Lab., Lemont, Ill.
HIGH TEMPERATURE AQUEOUS CORROSION OF ALUMINUM ALLOYS, by Draley and others. 18p.
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FINAL REPORT ON HIGH TEMPERATURE TESTING OF TYPE 316 STAINLESS STEEL SHEET; Nov 1950 to June 1951, by Guarneri. 1951. 38p.
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February 1961

USCOMM-DC-61756